

#16721433

ID: 88012908

HD
241
G62
1978

PRIVATE ADJUSTMENTS TO CHANGES IN
GRAZING ON PUBLIC LANDS* X

BLM Library
D-553A, Building 50
Denver Federal Center
P. O. Box 25047
Denver, CO 80225-0047

A Final Report

Submitted to the Forest Service

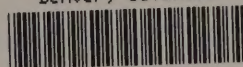
Bureau of Land Management
Library
Bldg. 50, Denver Federal Center
Denver, CO 80225

by

E. Bruce Godfrey
Associate Professor
Department of Economics
Utah State University
Logan, Utah

BUREAU OF LAND MANAGEMENT LIBRARY

Denver, Colorado



88012908

May, 1978

U.S. DEPARTMENT OF JUSTICE
FEDERAL BUREAU OF INVESTIGATION
P. O. Box 2007
Denver, CO 80202-0207

PRIVATE ADJUSTMENTS TO CHANGES IN
GRAZING ON PUBLIC LANDS*

by

E. Bruce Godfrey**

Most range lands found in the western United States have been grazed by domestic cattle for approximately a century. This historical use has not been uniform over time, however. For example, use before the early 1900's was uncontrolled and generally very heavy, which resulted in decreased productivity. The establishment of the forest reserves near the turn of the century, and the Grazing Service in 1934 marked two turning points which brought grazing on public lands primarily under the jurisdiction of two governmental agencies--the Forest Service (FS) and the Bureau of Land Management (BLM). The dominance of these two agencies in public grazing is illustrated by the fact that in 1966 nearly 98 percent of the federal land allocated for grazing was administered by these two agencies (Pacific Consultants and University of Idaho, 1970).

As would be expected, the use of federal range lands by domestic livestock has decreased over time. For example, the data in Figures 1 and 2 indicate that the total number of sheep, goats, cattle and horses using FS and BLM lands has declined over the period for which records are

*Support for this research was obtained from a grant from the Forest Service.

**Associate Professor, Utah State University, Logan.

PRIVATE ADJUSTMENTS TO CHANGES IN

GRASSING IN PUBLIC LANDS

by

E. Bruce Gentry

Most range lands found in the western United States have been grazed by domestic cattle for approximately a century. This historical use has not gone without some effect, however. For example, the early 1900's saw uncontrolled and generally severe range erosion resulting in the erosion of productivity. The establishment of the Forest Service near the turn of the century, and the Grazing Service in 1934 marked the turning point when thought began to be given to the better management of the range. The Forest Service (FS) and the Bureau of Land Management (BLM) have since been the two agencies in charge of public range land. The BLM was created in 1946 nearly 50 percent of the national land area for grazing was administered by these two agencies. (Bureau of Land Management and Department of the Interior, 1970).

As would be expected, the use of public range lands by domestic livestock has decreased over time. For example, the data in Figure 1 and 2 indicate that the total number of sheep, goats, cattle and horses on public lands has declined over the period for which records are

Available for this research was obtained from a grant from the Forest Service, U.S. Department of the Interior, Washington, D.C.

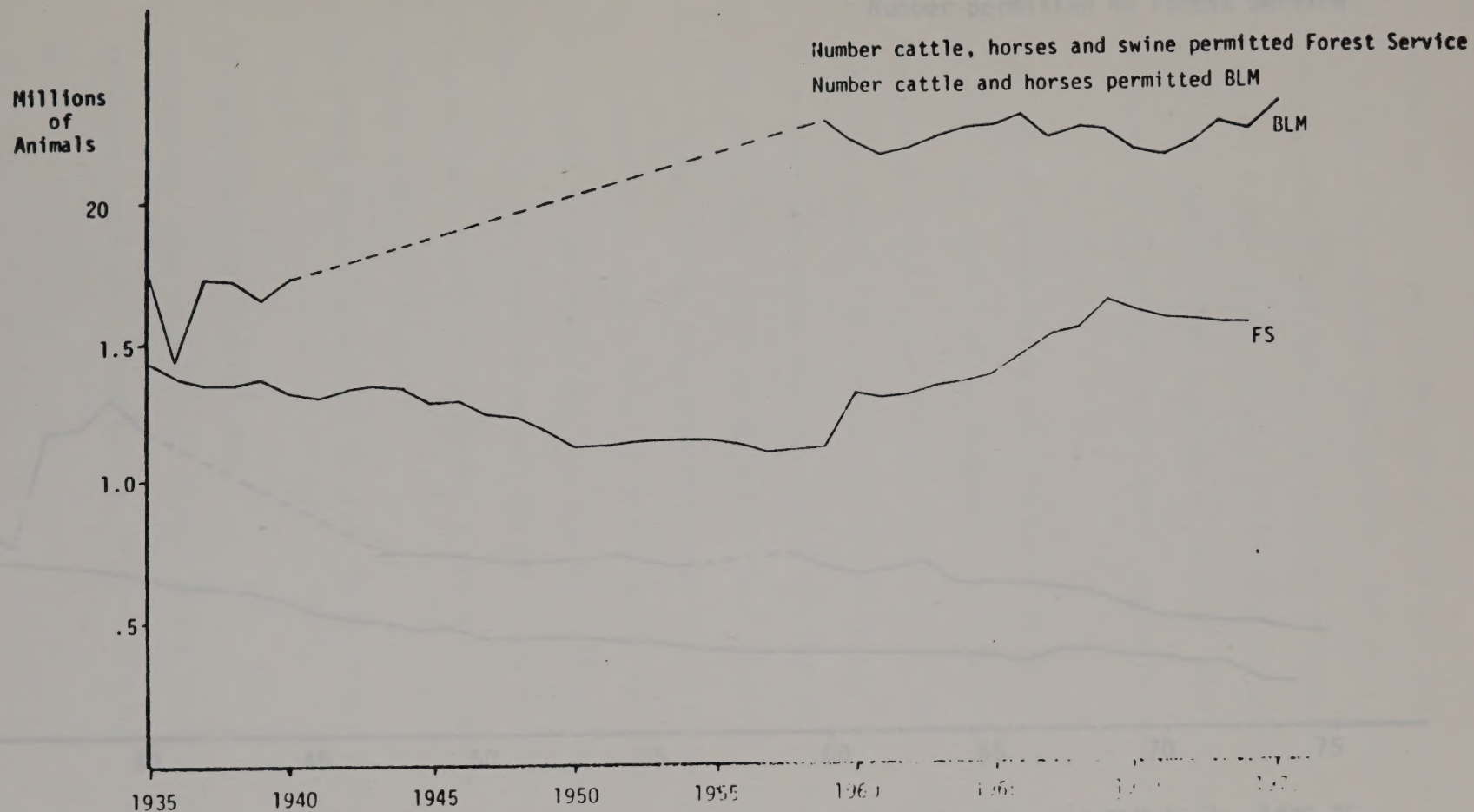


Figure 1. Number of cattle and horses permitted to graze BLM and Forest Service land, 1935-75.

Sources: Clawson and Held, unpublished reports Intermountain Forest and Range Experiment Station, Public Land Statistics.

Total number stock sheep

Number permitted on BLM

Number permitted on Forest Service

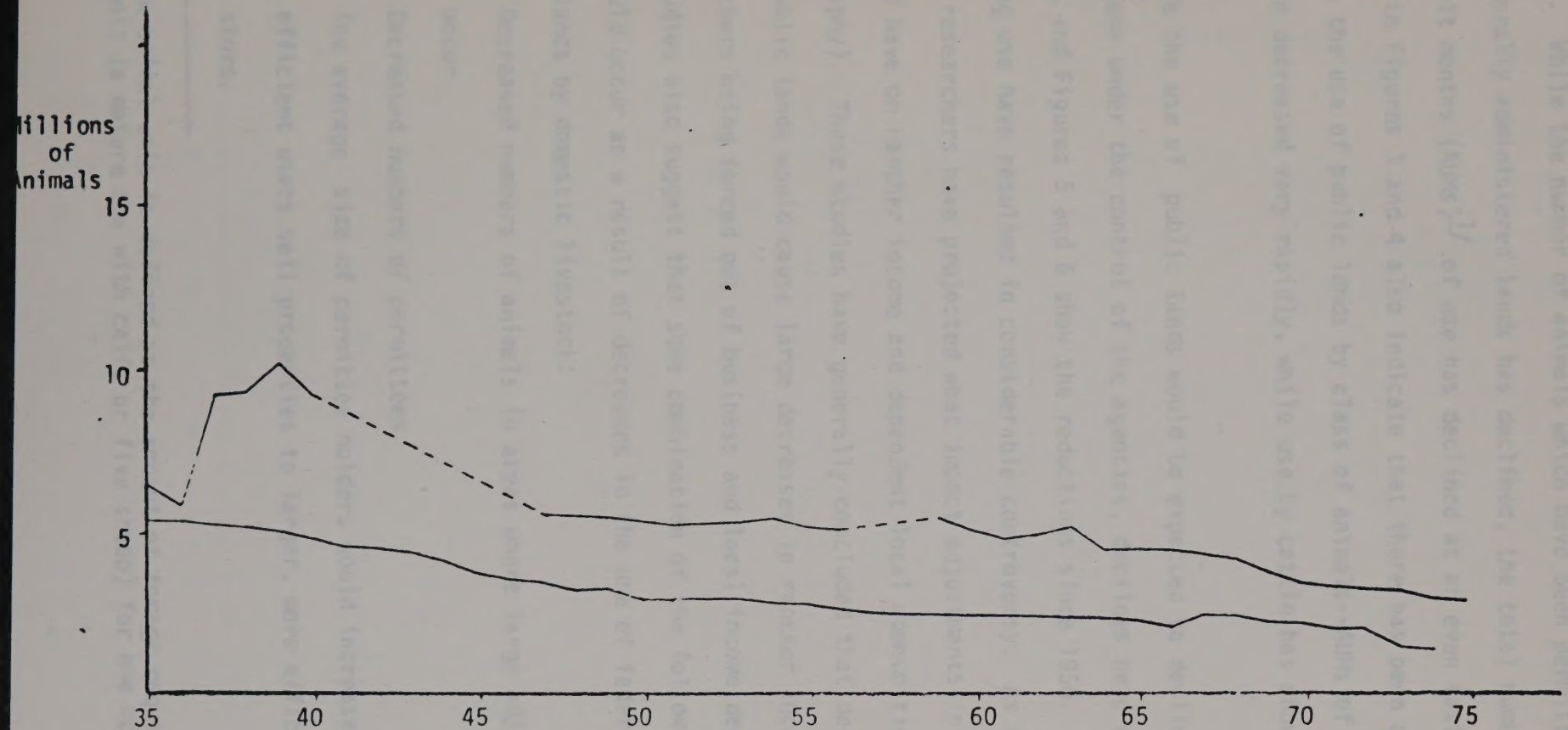
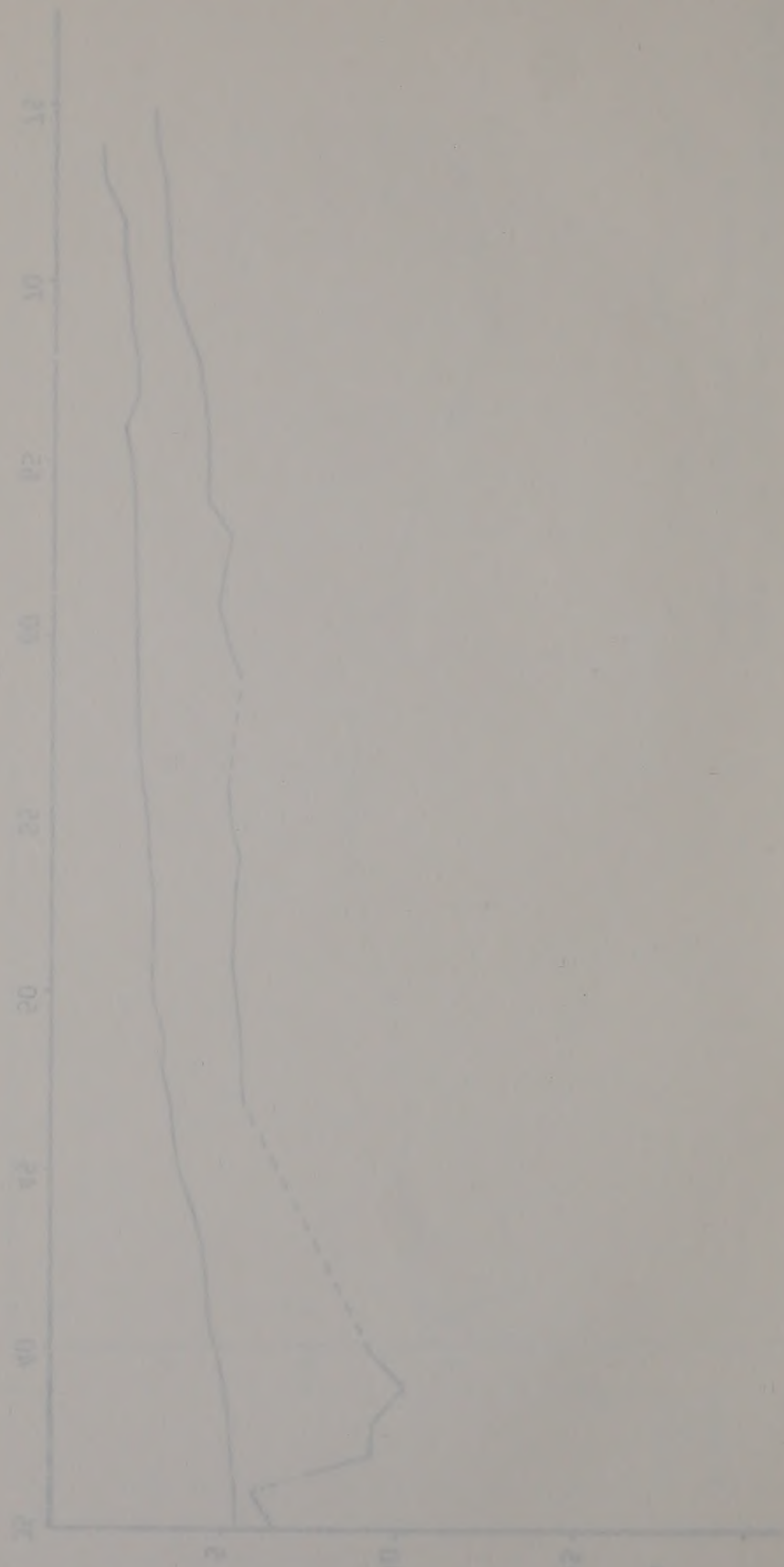


Figure 2. Number of sheep and goats permitted to graze Forest Service and BLM lands, 1935-75.

Source: Clawson and Held, Intermountain Forest Range Experiment Station, Public Land Statistics.

Figure 5. Number of species and genera recorded in the bottoming group and the top of the group. The number of species and genera recorded in the bottoming group and the top of the group. The number of species and genera recorded in the bottoming group and the top of the group.



Number of species and genera recorded in the bottoming group and the top of the group. The number of species and genera recorded in the bottoming group and the top of the group. The number of species and genera recorded in the bottoming group and the top of the group.

available. While the number of animals which have been permitted to graze federally administered lands has declined, the total number of animal unit months (AUMs)^{1/} of use has declined at an even faster rate. The data in Figures 3 and 4 also indicate that there has been a major change in the use of public lands by class of animals--AUMs of use by sheep have decreased very rapidly, while use by cattle has shown modest declines.

While the use of public lands would be expected to decline once grazing came under the control of the agencies, declines have continued to occur, and Figures 5 and 6 show the reductions since 1950. These cuts in grazing use have resulted in considerable controversy. As a result, numerous researchers have projected what impact adjustments in grazing use would have on rancher income and dependent local communities (see Bibliography). These studies have generally concluded that decreased use of public lands would cause large decreases in rancher income, with some ranchers being forced out of business and local income decreasing. These studies also suggest that some combination of the following adjustments would occur as a result of decreases in the use of federally administered lands by domestic livestock:

1. Decreased numbers of animals in areas where large adjustments occur.
2. Decreased numbers of permittees.
3. The average size of permittee holders would increase as less efficient users sell properties to larger, more efficient operators.

^{1/}An animal unit is defined as the amount of forage required by an animal unit (a mature cow with calf, or five sheep) for one month (Heady, 1975).

Notes:

1. Decreased number of animals in areas where large adjustments occur.
2. Decreased number of permits.
3. The average size of permitted holders would increase as less efficient users sell properties to larger, more efficient operators.

Isolated lands by domestic livestock:

These studies also suggest that some combination of the following adjustments would occur as a result of decreases in the use of federally administered lands by domestic livestock:

1. Some ranchers being forced out of business and local income decreasing.

2. Use of public lands would cause large decreases in rancher income, with

3. Bibliography). These studies have generally concluded that decreases in use would have on rancher income and dependent local communities (see numerous researchers have projected what impact adjustments in grazing in grazing use have resulted in considerable controversy. As a result, to occur, and Figures 2 and 3 show the reductions since 1950. These cuts resulting came under the control of the agencies, declines have continued

declines.

sheep have decreased very rapidly, while use by cattle has shown modest change in the use of public lands by class of animals--AUMs of use by The data in Figures 3 and 4 also indicate that there has been a major animal unit months (AUM) of use has declined at an even faster rate. While the number of animals which have been permitted to graze federally administered lands has declined, the total number of available.

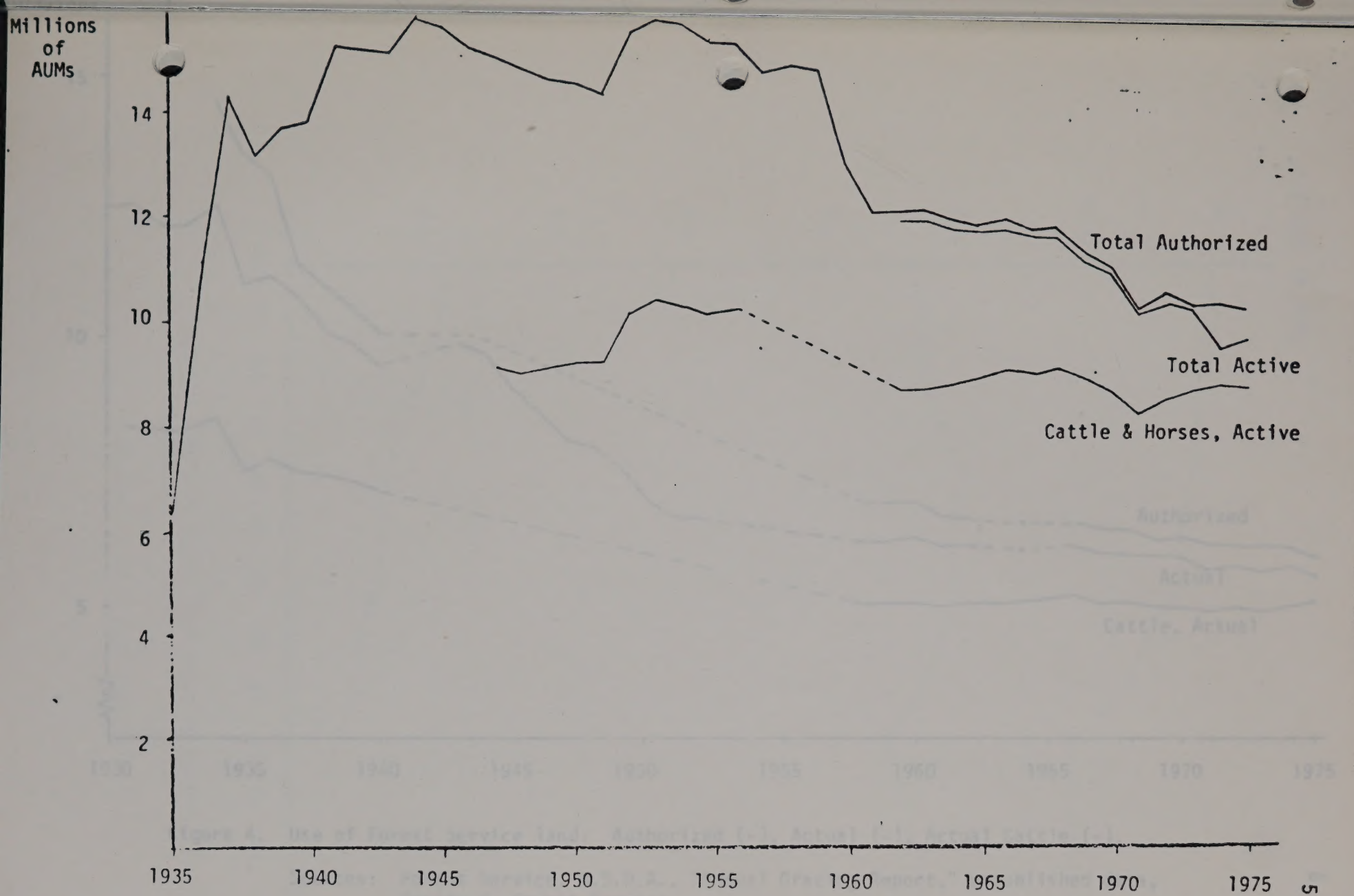


Figure 3. Use of BLM lands by domestic livestock, 1935-75.

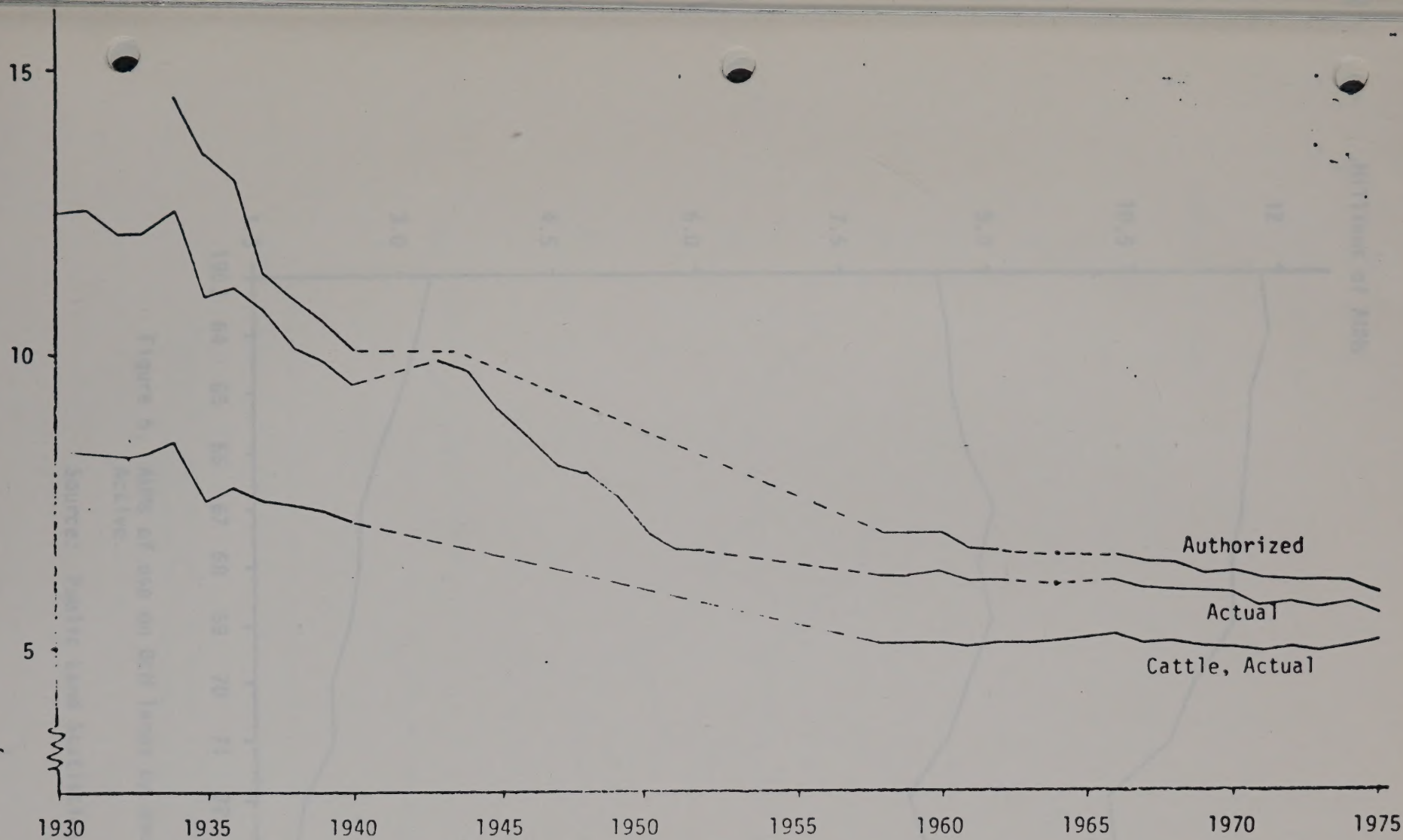


Figure 4. Use of Forest Service land: Authorized (-), Actual (-), Actual Cattle (-).

Sources: Forest Service, U.S.D.A., "Annual Grazing Report," unpublished data, Region 4, Forest Service.

Millions of AUMs

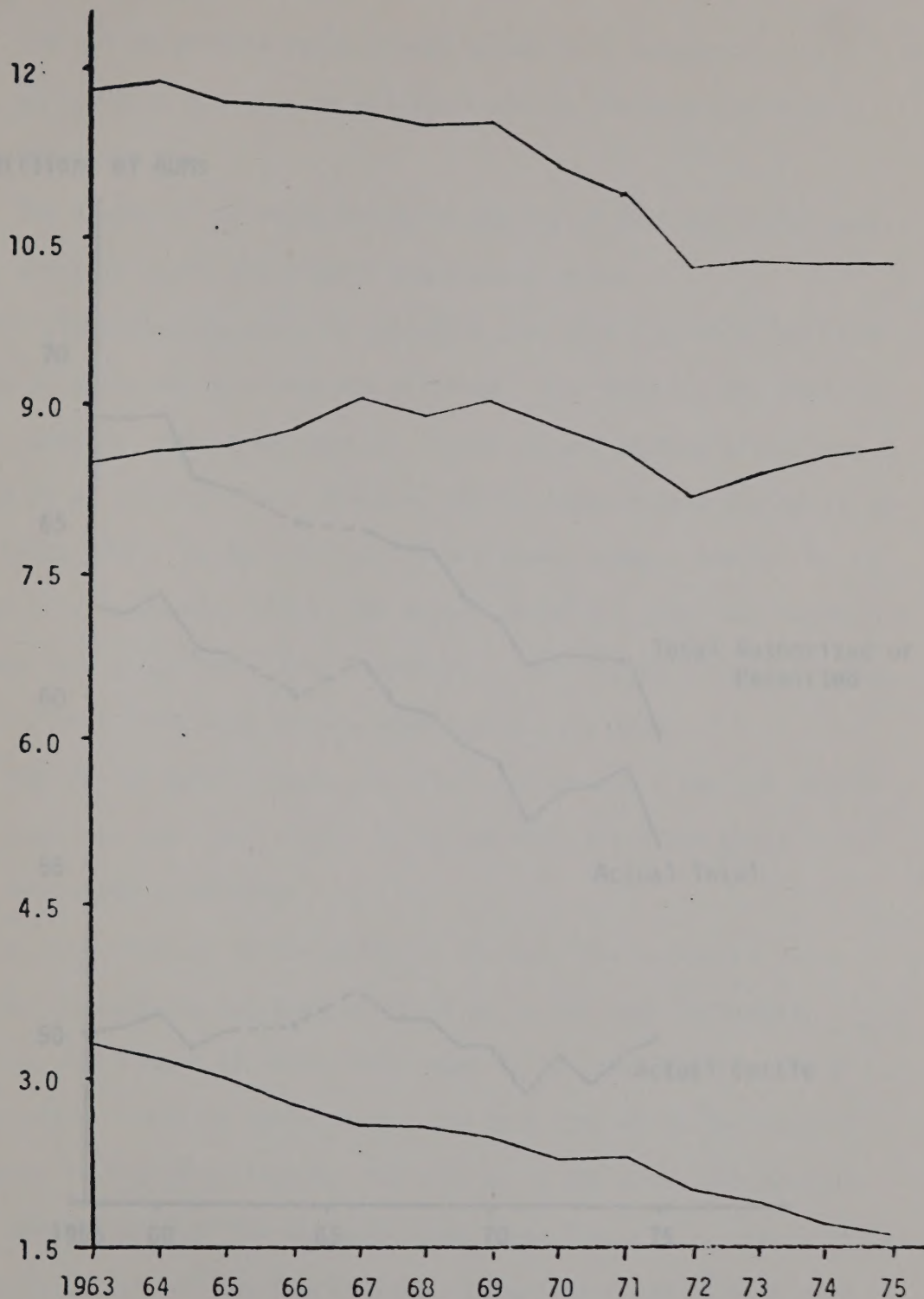


Figure 5. AUMs of use on BLM lands by domestic livestock, Active.

Source: Public Land Statistics.

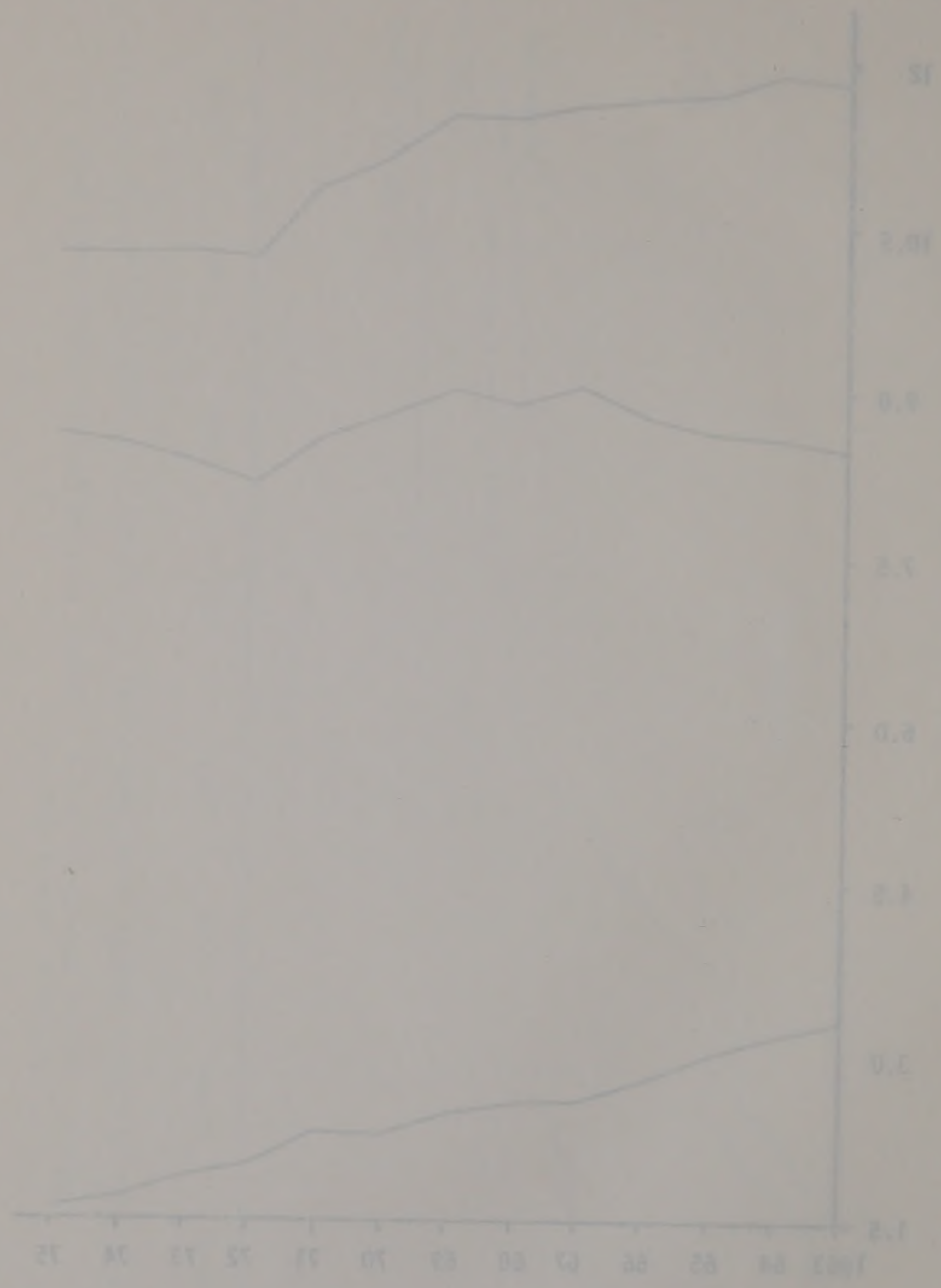


Figure 2. Change in use of land in the United States by domestic livestock.
Active.
Source: Public Land Statistics.

Millions of AUMs

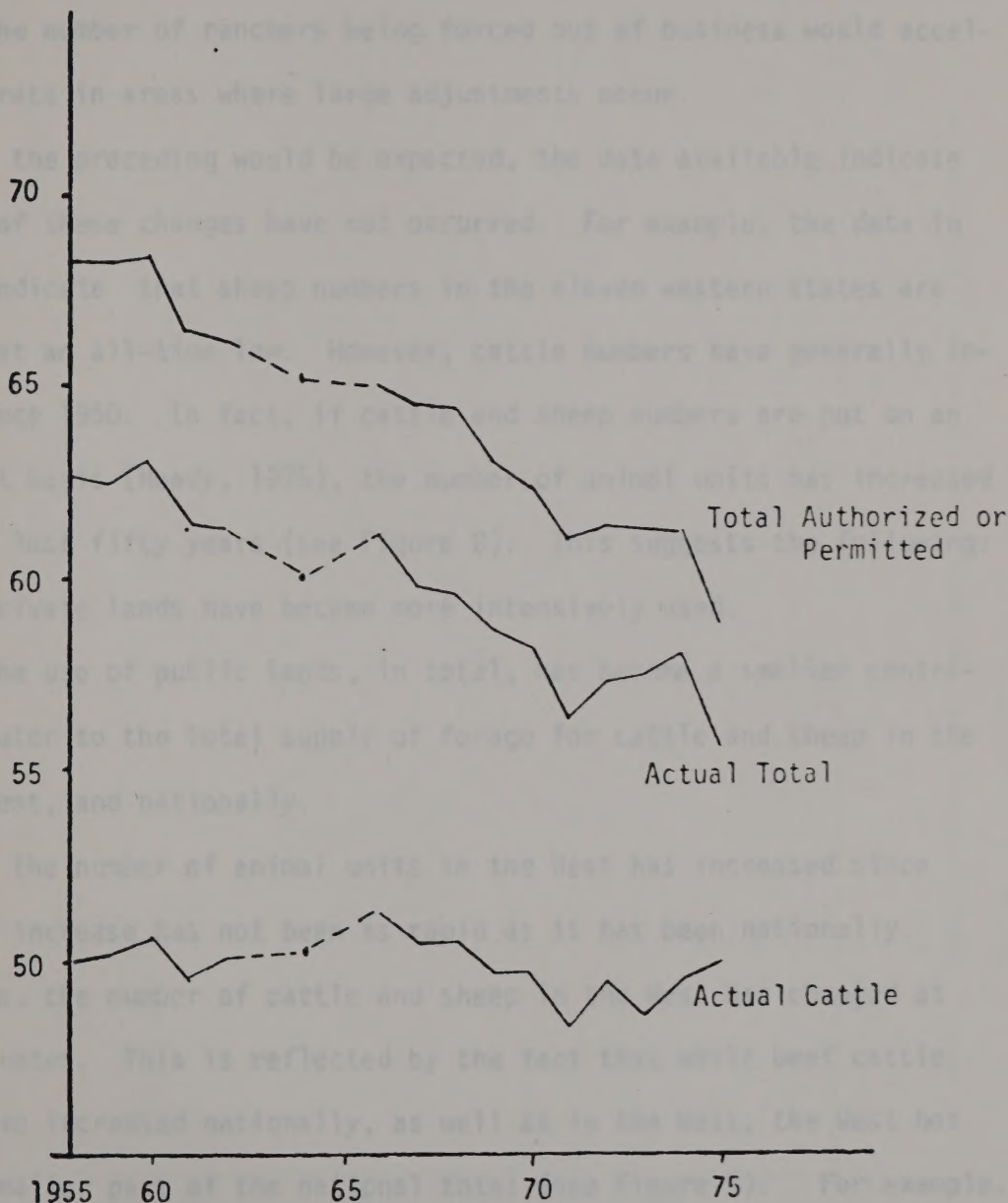


Figure 6. Authorized (-), Actual (-), AUMs of use by domestic livestock on Forest Service lands, 1958-75.

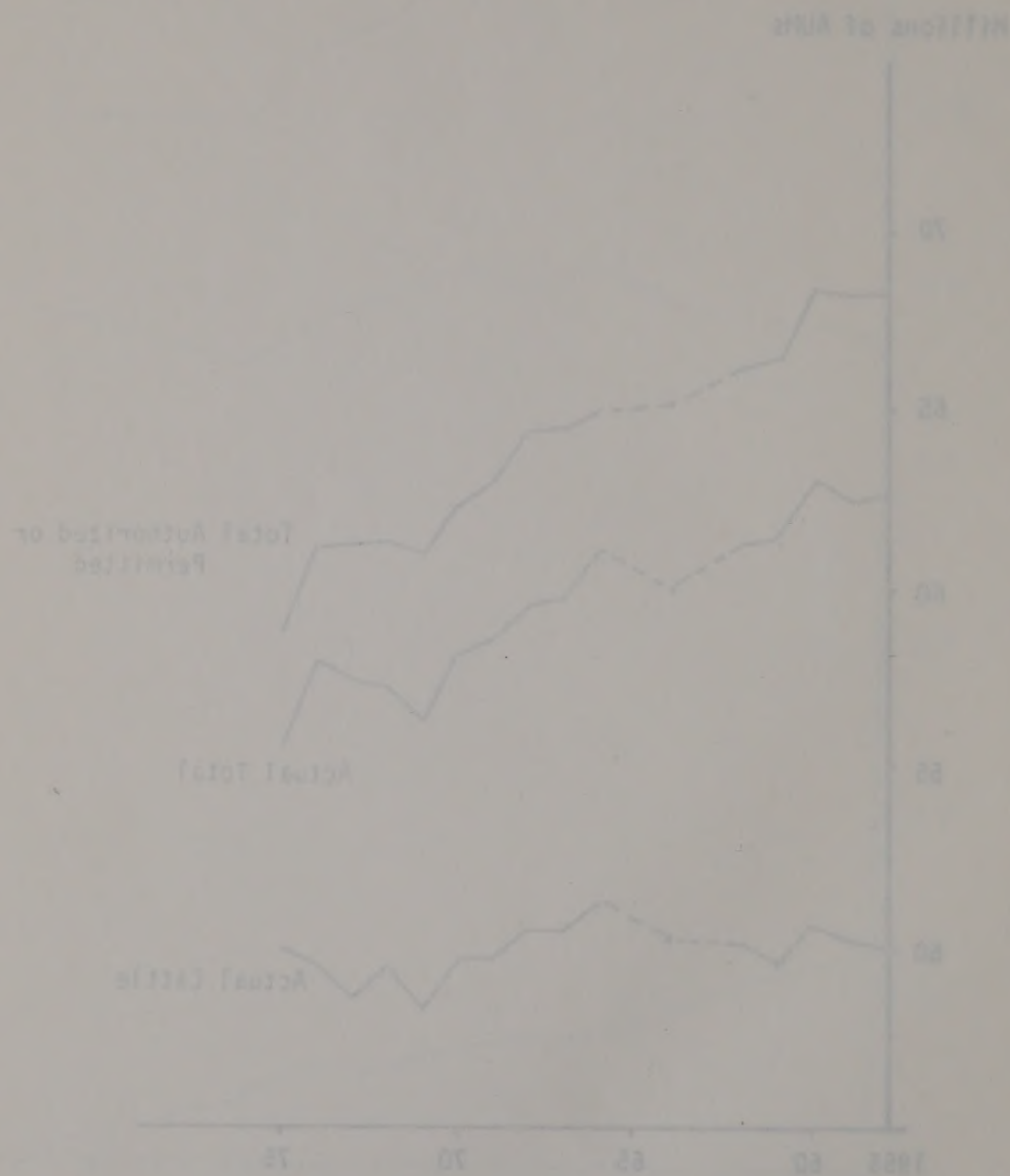


Figure 6. Authorized (-), Actual (-), and Actual Cattle by domestic livestock on Forest Service lands, 1958-75.

4. The use of private lands should become more intensive--i.e., more inputs are used on private lands to increase their productivity.
5. The number of ranchers being forced out of business would accelerate in areas where large adjustments occur.

While the preceding would be expected, the data available indicate that some of these changes have not occurred. For example, the data in Figure 7 indicate that sheep numbers in the eleven western states are presently at an all-time low. However, cattle numbers have generally increased since 1950. In fact, if cattle and sheep numbers are put on an animal unit basis (Heady, 1975), the number of animal units has increased during the last fifty years (see Figure 8). This suggests the following:

1. Private lands have become more intensively used.
2. The use of public lands, in total, has become a smaller contributor to the total supply of forage for cattle and sheep in the West, and nationally.

While the number of animal units in the West has increased since 1950, this increase has not been as rapid as it has been nationally. Furthermore, the number of cattle and sheep in the West has changed at differing rates. This is reflected by the fact that while beef cattle numbers have increased nationally, as well as in the West, the West has become a smaller part of the national total (see Figure 9). For example, more than 27 percent of the total number of beef cows and heifers were found in the eleven Western states in 1950. Since that time, this percentage has dropped, at a relatively steady rate, to 17.8 percent in 1977. This trend suggests that the West may have lost its reputation as the nursery for feedlots in the Midwest. This trend is also borne out by the

very far behind in the Midwest. This trend is also borne out by the
 This trend suggests that the West may have lost its reputation as the nur-
 cery for feedlots in the Midwest. This trend is also borne out by the
 percentage has dropped, at a relatively steady rate, to 17.8 percent in 1937.
 found in the eleven western states in 1930. Since that time, this per-
 centage has dropped, at a relatively steady rate, to 17.8 percent in 1937.
 more than 50 percent of the total number of beef cows and heifers were
 become a smaller part of the national total (see Figure 8). For example,
 numbers have increased nationally, as well as in the West, the West has
 differing rates. This is reflected by the fact that while beef cattle
 Furthermore, the number of cattle and sheep in the West has changed at
 1930, this increase has not been as rapid as it has been nationally.
 While the number of animal units in the West has increased since
 West, and nationally.

1. Private lands have become more intensively used.
2. The use of public lands, in total, has become a smaller contri-
 butor to the total supply of forage for cattle and sheep in the
 West, and nationally.

During the last fifty years (see Figure 8). This suggests the following:

animal unit basis (head, 1937), the number of animal units has increased
 increased since 1930. In fact, if cattle and sheep numbers are put on an
 presently at an all-time low. However, cattle numbers have generally in-
 Figure 7 indicate that sheep numbers in the eleven western states are
 that some of these changes have not occurred. For example, the data in
 While the preceding would be expected, the data available indicate
 exists in areas where large adjustments occur.

2. The number of ranchers being forced out of business would accor-

ductivity.

4. The use of private lands should become more intensive--i.e.,
 more lands are used on private lands to increase their pro-

1,000's
of Animals

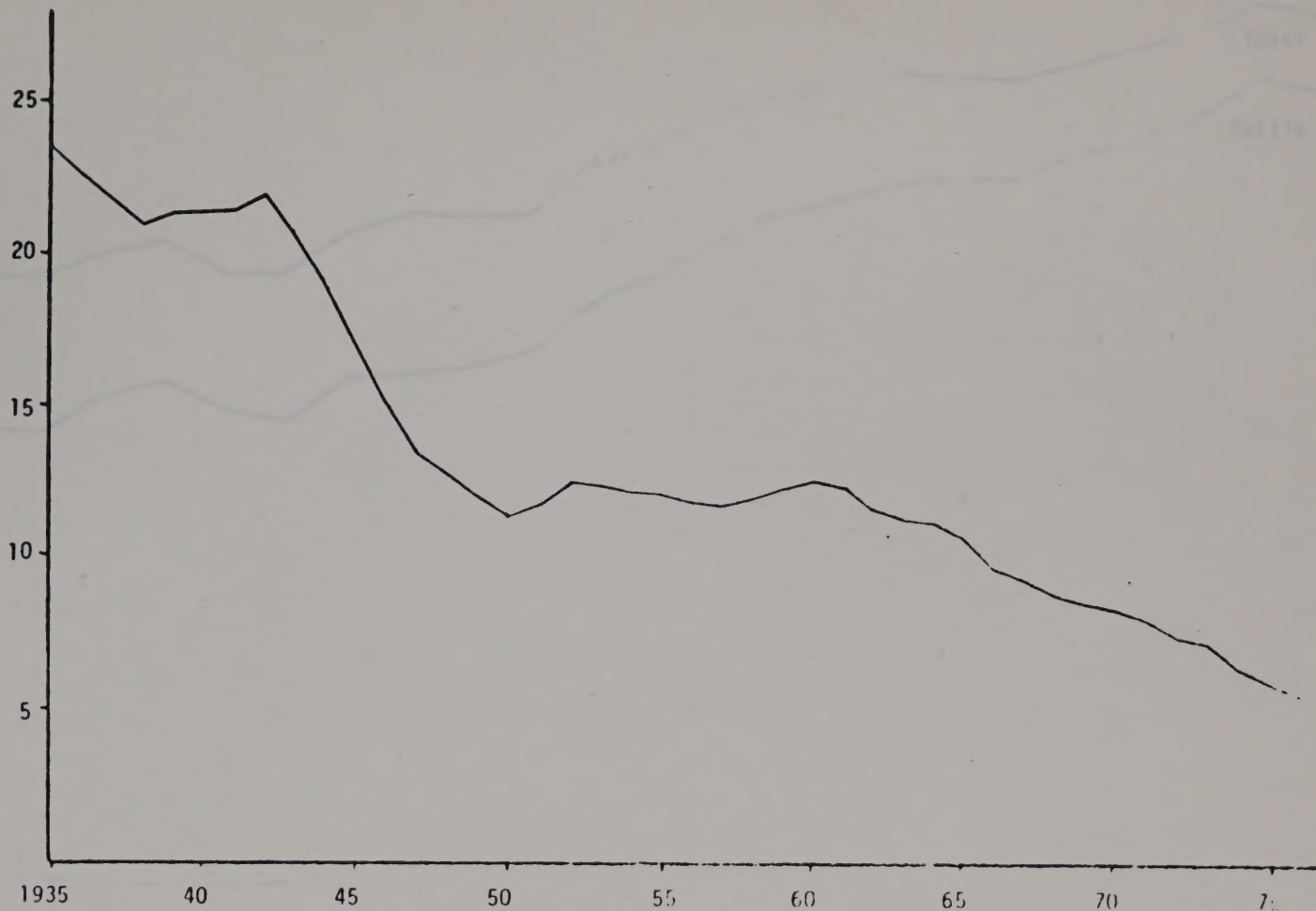
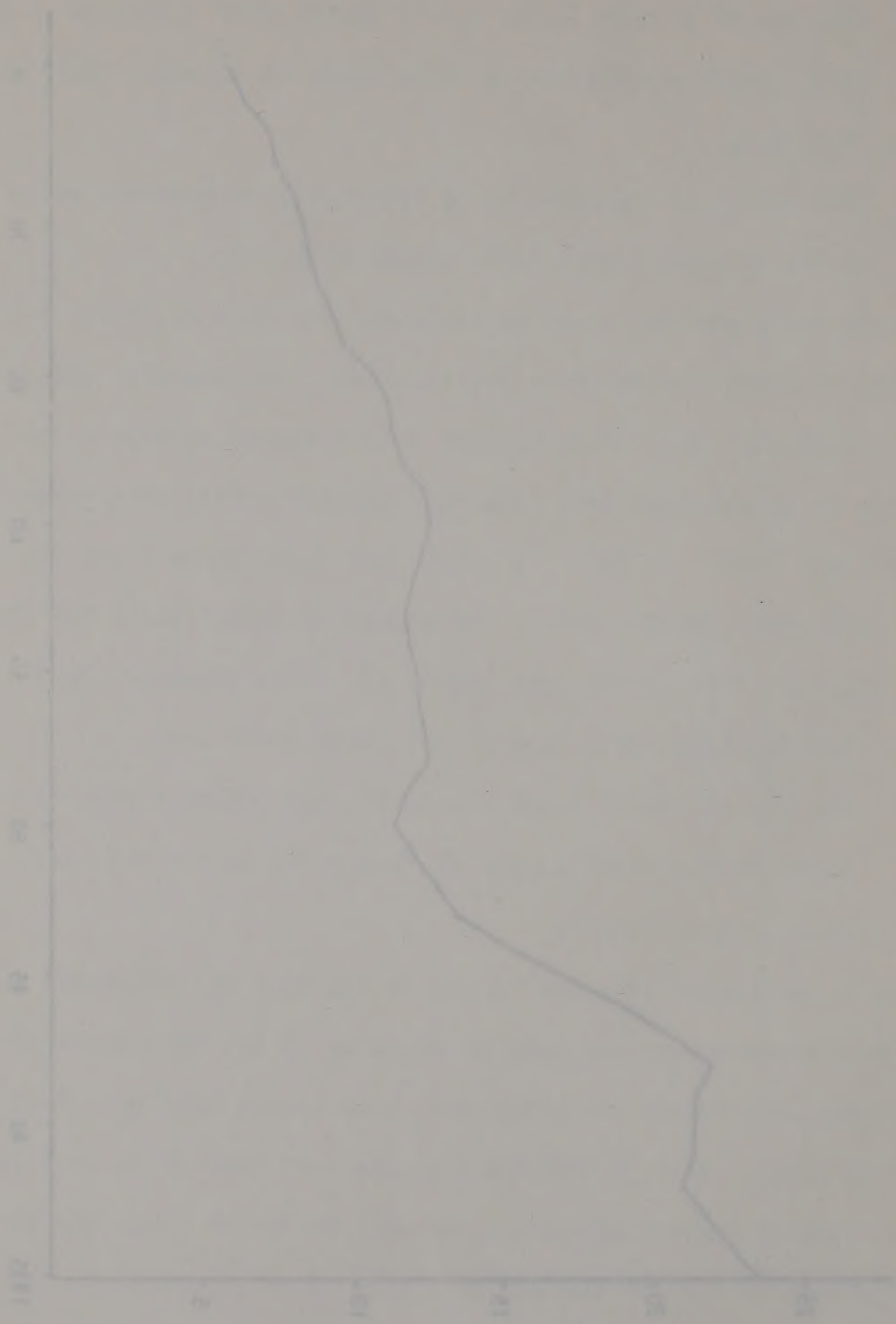


Figure 7. Number of stock sheep and lambs in eleven western states, 1935-77.

Source: Agricultural Statistics.

11

Vertical distance from base of rock to water level
Average length of rock



Vertical distance from base of rock to water level

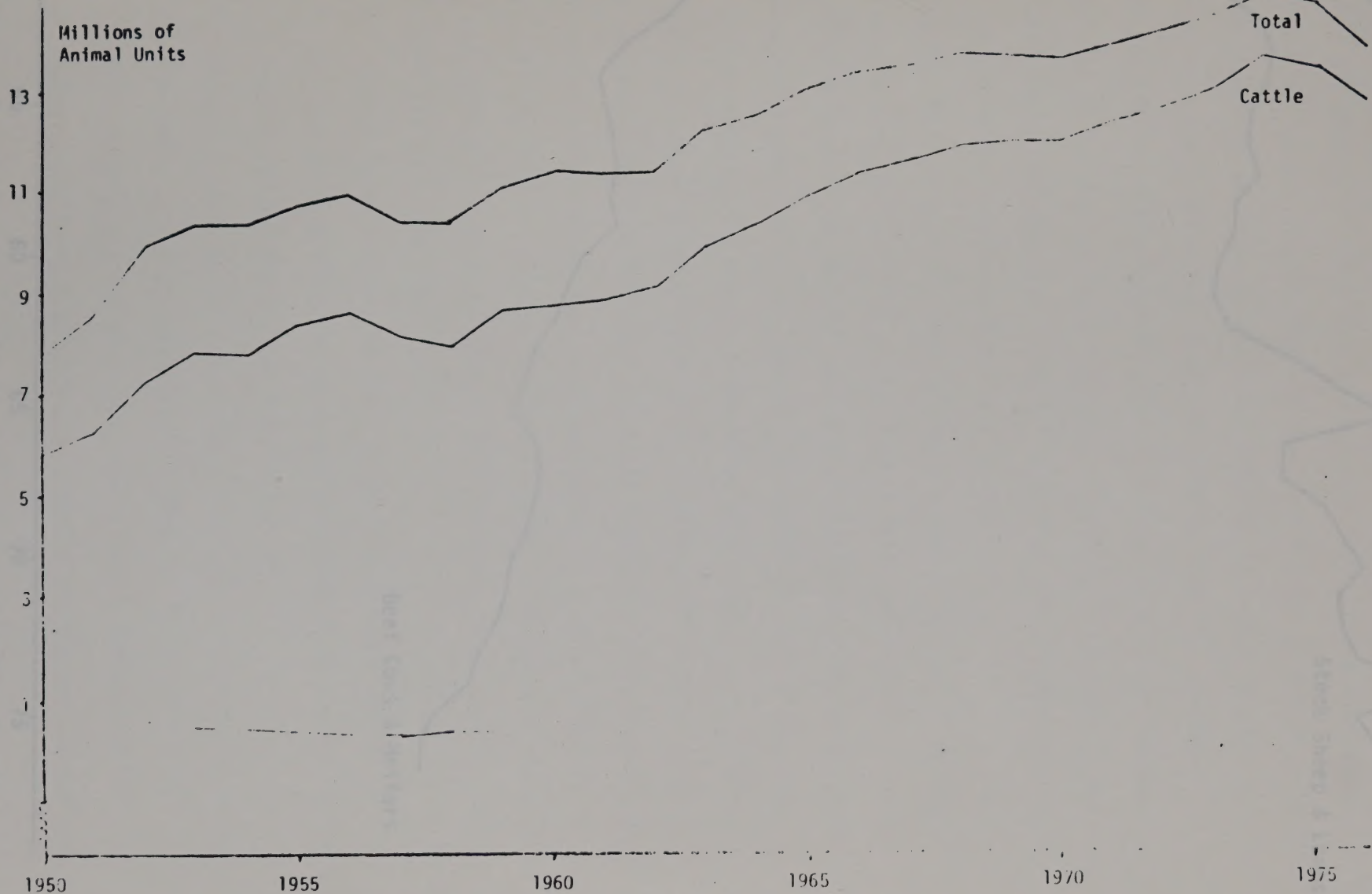


Figure 8. Animal Units of domestic livestock, eleven western states, 1950-75.
Source: Agricultural Statistics.

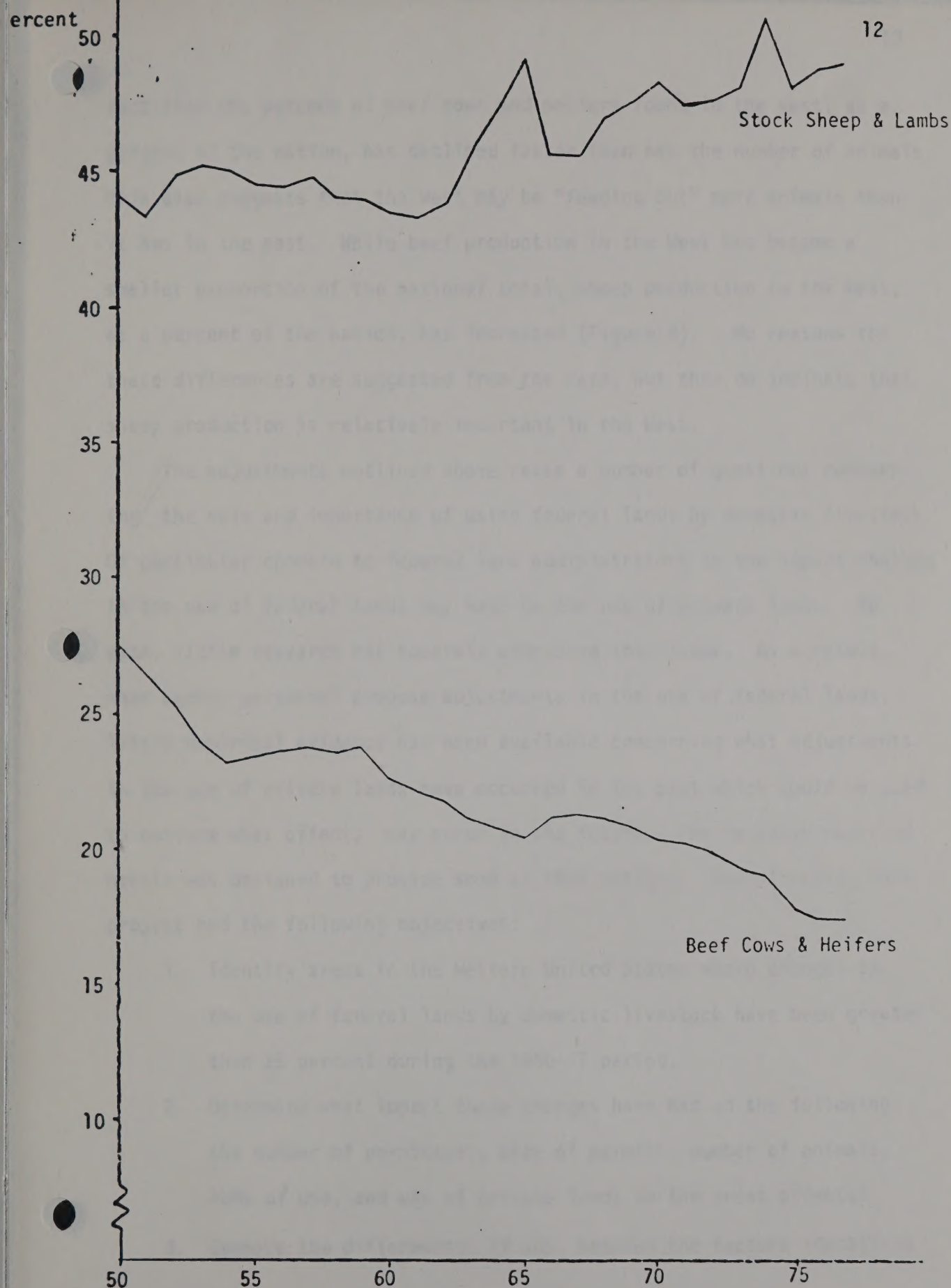
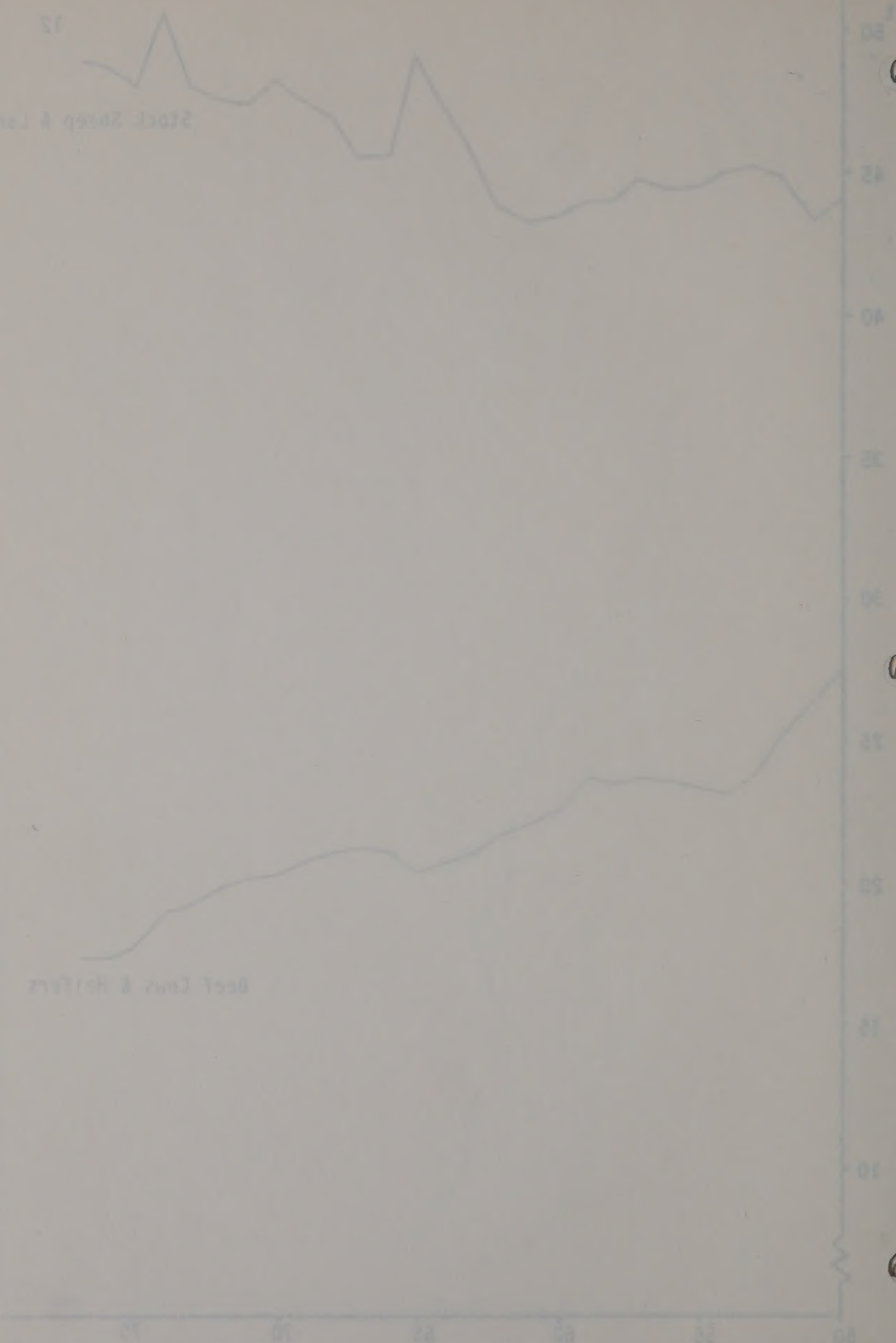


Figure 9. Stock sheep and lambs, beef cows and heifers in the eleven western states as percent of U.S. total, 1950-77.

Source: Agricultural Statistics.

Figure 3. Stock sheep and goats, beef cows and huffers in the
 given western states as percent of U.S. total, 1922-77.



fact that the percent of beef cows and heifers found in the West, as a percent of the nation, has declined faster than has the number of animals. This also suggests that the West may be "feeding out" more animals than it has in the past. While beef production in the West has become a smaller proportion of the national total, sheep production in the West, as a percent of the nation, has increased (Figure 9). No reasons for these differences are suggested from the data, but they do indicate that sheep production is relatively important in the West.

The adjustments outlined above raise a number of questions concerning the role and importance of using federal lands by domestic livestock. Of particular concern to federal land administrators is the impact changes in the use of federal lands may have on the use of private lands. To date, little research has squarely addressed this issue. As a result, when agency personnel propose adjustments in the use of federal lands, little empirical evidence has been available concerning what adjustments in the use of private lands have occurred in the past which could be used to outline what effects may occur in the future. The research reported herein was designed to provide some of this insight. Specifically, this project had the following objectives:

1. Identify areas in the Western United States where changes in the use of federal lands by domestic livestock have been greater than 25 percent during the 1950-77 period.
2. Determine what impact these changes have had on the following: the number of permittees, size of permits, number of animals, AUMs of use, and use of private lands in the areas affected.
3. Compare the differences, if any, between the factors identified

in Objective #2 with similar areas where adjustments in the use of federal lands by domestic livestock have been small.

STUDY METHODS

The data in the preceding figures indicated that the use of federal lands by domestic livestock has declined over time. These adjustments have, however, been dispersed throughout the West. As a result, it became necessary to ask FS and BLM personnel to identify areas where major adjustments have occurred. Each of the BLM districts and forests shown in Table 1 were asked to identify any allotments, ranger districts, or planning units where changes in use during the 1950-75 period were greater than 25 percent.

Agency personnel found this request to be difficult for a number of reasons. First, personnel were generally not familiar with the historical use of specific areas, because most agency personnel have been at their present location a relatively short period of time. Second, some adjustment in use has occurred on most allotments administered by the BLM and FS. It therefore became necessary to identify those areas where use had changed more than 25 percent. The most common problem faced by agency personnel, however, was either the lack of historical records, or if data were available, a major effort would be required to trace usage utilizing permittee and/or allotment files. The problems encountered differed by agency, however.

BLM personnel generally had a different problem identifying areas where major adjustments had occurred, because actual use data for BLM lands is rarely available. The best estimates are generally contained

Table 1. BLM Districts and National Forests included in the study area.

STATE	BLM DISTRICTS	FORESTS
Idaho	Salmon, Boise, Shoshone, Idaho Falls, Burley	Salmon, Caribou, Challis, Sawtooth, Boise, Targee
Wyoming	Rock Springs,* Worland	Shoshone,* Teton-Bridger*
Colorado	Grand Junction, Craig, San Juan,* Montrose	White River, Routt, San Juan, Rio Grande,* Grand Mesa, Uncompahgre, Gunnison
Arizona	Safford, Arizona Strip	Kiabab
Utah	Moab, St. George, Salt Lake, Cedar City, Richfield, Vernal	Ashley, Uintah, Dixie, Fishlake, Manti-LaSal, Wasatch
New Mexico	Farmington*	
Montana	Dillon Resource Area*	Bitterroot,* Gallatin, Beaverhead*
Nevada	Las Vegas, Ely, Winnemucca,* Elko	Humboldt
Oregon	Vale	

*Districts or Forests not responding to requests for information.

in permittee files, allotment management plans, management framework plans, adjudication records, and other narrative summaries. The adjudication files are generally the best estimates available, but these are generally found in operator files, which may not be complete. Furthermore, when permits are transferred, the original permittee file is generally placed in a "dead file" and sent to a federal records depository. Obtaining all of these records is very time consuming. As a result, computer printouts from the Denver Service Center and local summaries (AMP, MFP, etc.) became the major sources of useful information. In general, it was assumed that use before adjudication was at the Class I level, and that current permitted (active) use had prevailed since that time--unless information was available to the contrary.

This data could bias^{2/} the results reported, because permitted use of BLM lands may be greater or less than actual use in any one year. Thus, any reported adjustments which are based on licensed use could easily differ from the actual adjustments. It is felt, however, that any resultant bias is probably not large, because some operators may trespass (actual use > permitted), while other operators have historically placed fewer animals (or grazed them for a shorter period) on federal lands than their permits would allow.

Forest Service personnel faced problems which differed from those encountered by the BLM. Most forests and ranger districts maintain records of permitted and actual use (until 1972) of allotments within their jurisdiction. However, the boundaries of many allotments have been changed over time. In addition, changes in forest boundaries have

^{2/} No data is available which could be used to measure this possible bias.

resulted in the transfer of records from one forest to another. These and other similar types of changes have resulted in lost files, as well as creating problems of tracing the use of an area over time, but these problems were generally not insurmountable. As a result, grazing records contained in the allotment file folders were the primary source of data used to trace the use of FS lands over time.^{3/}

After agency personnel had identified areas where grazing use had changed more than 25 percent since 1950, it became necessary to tie these changes in with the use of base properties in counties within a state, because time and budgetary constraints did allow the collection of primary data from the permittees involved.^{4/} This resulted in a number of complications. The most difficult problem involved the identification of large enough areas where adjustments of more than 25 percent had occurred that secondary data concerning the use of private land could be employed. Many isolated areas, primarily allotments, were identified where changes in use had been 25 percent or more, but they made up such a small portion of the use in the county involved that inferences at the county level would not be valid.

Data obtained from FS or BLM offices indicated that adjustments of 25 percent or more had occurred in several counties within the following states:

1. Idaho: Cassia, Bonneville, Clark, Gooding/Lincoln, Bear Lake, Teton, and Lemhi counties;

^{3/}Agency personnel generally did not use this source because it involved considerable work. These records were the primary source used in this study, however. USU personnel took the time to trace use using these records.

^{4/}An interesting and informative research project could trace adjustments using these data to see if the results would differ from those reported in this study.

resulted in the transfer of records from one folder to another. These and other similar types of changes have resulted in lost files, as well as creating problems of tracing the use of an area over time, but these problems were generally not insurmountable. As a result, grazing records contained in the adjustment file folders were the primary source of data used to trace the use of 52 lands over time.

After agency personnel had identified areas where grazing use had changed more than 25 percent since 1950, it became necessary to file these changes in with the use of these properties in counties within a state, because time and budgetary constraints did allow the collection of primary data from the permittees involved. This resulted in a number of complications. The most difficult problem involved the identification of large enough areas where adjustments of more than 25 percent had occurred that secondary data concerning the use of private land could be employed. Many isolated areas, primarily allotments, were identified where changes in use had been 25 percent or more, but they added up such a small portion of the use in the county involved that inferences of the agency level would not be valid.

Data obtained from 12 or 14 offices indicated that adjustments of 25 percent or more had occurred in 26-gram counties within the following states:

1. Idaho: Carls, Bonanza, Clark, Gooding, Lincoln, Bear Lake, Teton, and Latah counties;

2. Agency personnel generally did not use this source because it involved considerable work. These records were the primary source used in this study, however. All personnel took the time to trace use using these records.

3. In interesting and informative research project could trace adjustments using these data as well as the results would differ from those reported in this study.

2. Utah: Utah, Juab, Sevier, Sanpete, Kane, Beaver and San Juan Counties;
3. Colorado: Pitkin, Eagle, Garfield, Delta, Ouray; Gunnison and Montrose Counties;
4. Nevada: Lincoln and White Pine Counties;
5. Wyoming: Park, Washakie, Big Horn and Hot Springs Counties.

While some large adjustments have occurred in the areas indicated above, they do not represent all of the areas where adjustments have occurred. Other areas may have been included if the study area had been enlarged, or if some of the nonresponding units (Table 1) had sent the data requested.

Each of the preceding areas might have been included in this study, but most were eliminated for one or more of the following reasons:

1. Adjustments in the use of lands administered by one agency may have been large, while adjustments in the use of federal lands administered by other agencies were marginal. As a result, changes in the use of all federal lands in many of the areas indicated above were small--generally 15 percent or less.
2. Data obtained from one agency may have indicated large adjustments in use, but the other agency may not have responded. In these cases, it became necessary to eliminate these areas as study sites.
3. The use of federal lands in some areas may have changed a great deal; however, the permittees which used these lands may have base property (private lands) many miles from this area. As a result, changes in the use of some federal lands was so disper-

2. Utah: Utah, Utah, Beaver, Kane, Garfield and San Juan Counties;
 3. Colorado: Pitkin, Eagle, Garfield, Delta, Grand and Montrose Counties;
 4. Nevada: Lincoln and White Pine Counties;
 5. Wyoming: Park, Teton, Big Horn and Hot Springs Counties.
- While some large adjustments have occurred in the areas indicated above, they do not represent all of the areas where adjustments have occurred. Other areas may have been included in the study areas had been enlarged or if some of the nonresponding units (Table 1) had sent the data requested.
- Each of the preceding areas might have been included in this study, but most were eliminated for one or more of the following reasons:
1. Adjustments in the use of lands administered by one agency may have been large, while adjustments in the use of federal lands administered by other agencies were negligible. As a result, changes in the use of all federal lands in many of the areas indicated above were small--generally 15 percent or less.
 2. Data obtained from one agency may have indicated large adjustments in use, but the other agency may not have responded. In these cases, it became necessary to eliminate these areas as study sites.
 3. The use of federal lands in some areas may have changed a great deal; however, the permittees which used these lands may have been property (private lands) away from this area. As a result, changes in the use of some federal lands was so dispersed

sed that its possible effect on private lands could not be traced using secondary data.

The study sites which are included in this report, however, represent a wide spectrum of characteristics and adjustments. The data base used places several limitations on the results reported, however. As a result, the reader should remember the following limitations, which could bias the results reported. Several constraints (time, budget and data) did not allow a careful tracing of every permittee over time. Therefore, it became necessary to assume that all permittees whose base property was presently located in a particular county were representative of historical ownership. While some permits may have been associated with lands in other counties over time, it is unlikely that this bias is large.

In some cases, however, an operator may own land in more than one county that is used as "base property" for a federal grazing permit. Agency personnel were generally able to identify these operators and indicate in which county their "base property" was "primarily" located. If it was judged that a particular permittee's base property was "primarily" in another county, permit and use data for that operator was not included in the study. Permittees in a county who had permits to graze in areas where adjustments had not occurred could bias county adjustments, but this is generally not a problem, as most permits are held by ranchers who reside in the local area.

Once areas were delineated where adjustments in federal land use had occurred and these adjustments were tied to private lands, which provided the base for the use of federal lands, it became necessary to determine what impact these adjustments had on the use of these private

and that the possible effect on private lands could not be traced

using secondary data.

The study sites which are included in this report, however, represent

a wide spectrum of characteristics and adjustments. The data base used

places several limitations on the results reported, however. As a result,

the reader should remember the following limitations, which could bias

the results reported. Several constraints (time, budget, and data) did

not allow a careful tracing of every permittee over time. Therefore, it

became necessary to assume that all permittees whose base property was

presently located in a particular county were representative of historic

land ownership. While some permits may have been associated with lands

in other counties over time, it is unlikely that this bias is large.

In some cases, however, an operator may own land in more than one county

that is used as "base property" for a federal grazing permit. Agency

personnel were generally able to identify these operators and indicate

in which county their "base property" was "primarily" located. If it

was judged that a particular permittee's base property was "primarily"

in another county, permit and use data for that operator was not included

in the study. Permittees in a county who had permits to graze in areas

where adjustments had not occurred could bias county adjustments, but

this is generally not a problem, as most permits are held by ranchers

who reside in the local area.

Once areas were delineated where adjustments in federal land use

had occurred and these adjustments were tied to private lands, which

provided the base for the use of federal lands, it became necessary to

determine what impact those adjustments had on the use of these private

lands. While data obtained from private operators might have been used to trace these adjustments, budgetary and time limitations, as well as the general lack of private historical records, required the use of secondary data. The primary source used was the Census of Agriculture, which is published every five years. The reader should note that the data from this source is not as accurate as one might expect. Some of the reasons include: sampling bias, changes in definitions over time, as well as various types of statistical, typographical, and printing errors. As a result, published data from state offices of the statistical reporting service were also included when they were available. These data, however, are subject to many of the same errors associated with Census of Agriculture data, but these data are the only county-level agricultural data that is generally available.

While the procedures used provide estimates of what adjustments have occurred in areas affected by changes in the use of federal lands, they do not indicate what would have occurred in the absence of these adjustments. In an effort to obtain an estimate of these possible effects, at least one other county was also chosen where changes in the use of federal lands had been minimal. Data for the second county was then used to compare with private land adjustment data for the first county. Differences in land use between the first and the control county were the basis for identifying the impact of federal land use on private lands. This procedure is fraught with problems. Most of these problems stem from the fact that any county that may have been used as the "control" is generally not directly comparable with the counties where the adjustments occurred. As a result, state data was also used to compare with

lands. While data obtained from private operators might have been used to trace these adjustments, budgetary and time limitations, as well as the general lack of private historical records, required the use of secondary data. The primary source used was the Census of Agriculture, which is published every five years. The reader should note that the data from this source is not as accurate as one might expect. Some of the reasons for this include: sampling bias, changes in definitions over time, as well as various types of statistical, typographical, and printing errors. As a result, published data from state offices of the statistical reporting service were also included when they were available. These data, however, are subject to many of the same errors associated with Census of Agriculture data, but these data are the only county-level agricultural data that is generally available.

While the procedures used provide estimates of most adjustments being occurred in areas affected by changes in the use of federal lands, they do not indicate what would have occurred in the absence of these adjustments. In an effort to obtain an estimate of these possible effects, at least one other county was also chosen where changes in the use of federal lands had been minimal. Data for the second county was then used to compare with private land adjustment data for the first county. Differences in land use between the first and the control county were the basis for identifying the impact of federal land use on private lands. This procedure is fraught with problems. Most of these problems stem from the fact that any county that may have been used as the "control" is generally not directly comparable with the counties where the adjustments occurred. As a result, state data was also used to compare with

the adjustments in both counties. While the preceding problems limit the inferences that can be made from this study, these data provide the only ex post analysis available concerning adjustments that occur as a result of changing the use of federal lands by domestic livestock.

RESULTS

The areas included in this study differ with respect to topography, location, pattern of land ownership, and economic characteristics. As a result, they are probably quite representative of most areas in the West. The location of the study sites is outlined in Figure 10. The characteristics and use of federal and private lands within each of the study counties is summarized below.

Cassia County, Idaho

Cassia County is located in south central Idaho. Historical use of the area by domestic livestock has been heavy. This was particularly true near the turn of the century, when migratory sheep operations trailed herds through this area (Sharp, 1970). While irrigated agriculture plays a major part in the economy of the area, most of the land area is grazed by domestic livestock. This is illustrated by the data shown in Figure 11, which indicates that the amount of crop land is only slightly larger than is the amount of range land. Further emphasis of the dominance of range can be inferred from the fact that more than 57% of the 1,628,160 acres in the county is owned by the federal government. Of the total amount owned by the federal government, a large portion (approximately 56%) is administered by the BLM, while a smaller portion (43%) is administered by the Forest Service.

the adjustments in both counties. While the preceding paragraph limits the inferences that can be made from this study, these data provide the only export analysis available concerning adjustments that occur as a result of changing the use of federal lands by domestic livestock.

RESULTS

The areas included in this study differ with respect to topography, location, pattern of land ownership, and economic characteristics. As a result, they are probably quite representative of most areas in the West. The location of the study areas is outlined in Figure 10. The characteristics and use of federal and private lands within each of the study counties is summarized below.

Cassia County, Idaho

Cassia County is located in south central Idaho. Historical use of the area by domestic livestock has been heavy. This was particularly true near the turn of the century, when migratory sheep operations grazed lands through the area (Sharp, 1970). While irrigated agriculture plays a major part in the economy of the area, most of the land area is grazed by domestic livestock. This is illustrated by the data shown in Figure 11, which indicates that the amount of crop land is only slightly larger than is the amount of range land. Further emphasis of the dominance of range can be inferred from the fact that more than 57% of the 1,628,160 acres in the county is owned by the federal government. Of the total amount owned by the federal government, a large portion (approximately 26%) is administered by the BLM, while a smaller portion (43%) is administered by the Forest Service.

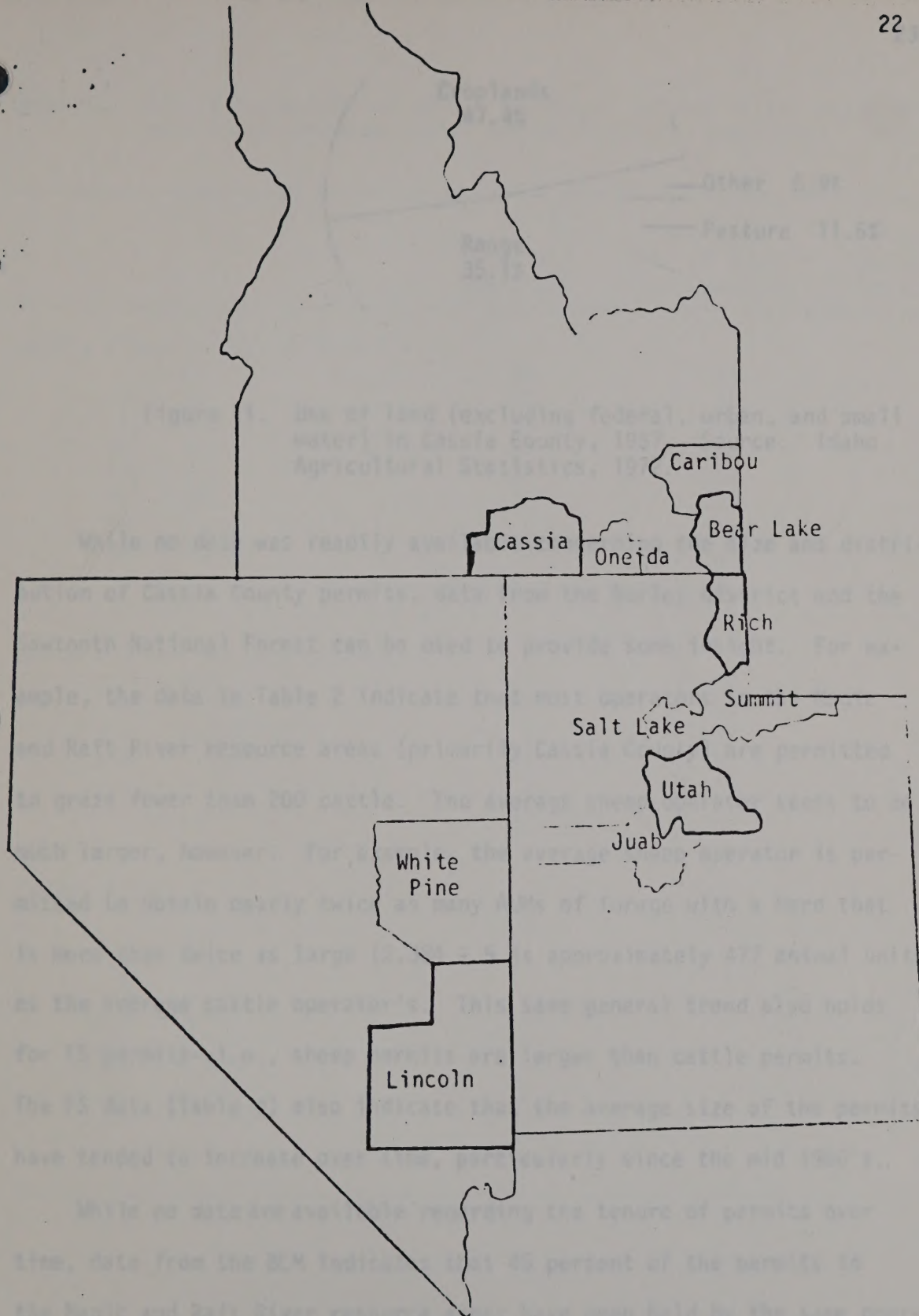


Figure 10. Test and control counties included in the study.



Figure 10. Test and control counties included in the study.

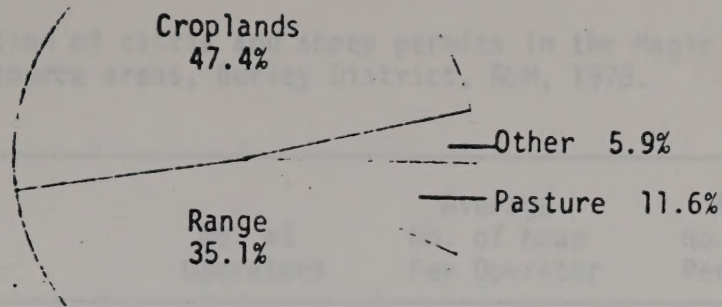


Figure 11. Use of land (excluding federal, urban, and small water) in Cassia County, 1967. Source: Idaho Agricultural Statistics, 1972.

While no data was readily available concerning the size and distribution of Cassia County permits, data from the Burley district and the Sawtooth National Forest can be used to provide some insight. For example, the data in Table 2 indicate that most operators in the Magic and Raft River resource areas (primarily Cassia County) are permitted to graze fewer than 200 cattle. The average sheep operator seems to me much larger, however. For example, the average sheep operator is permitted to obtain nearly twice as many AUMs of forage with a herd that is more than twice as large ($2,384 \div 5$ is approximately 477 animal units) as the average cattle operator's. This same general trend also holds for FS permits--i.e., sheep permits are larger than cattle permits. The FS data (Table 3) also indicate that the average size of the permits have tended to increase over time, particularly since the mid 1960's.

While no data are available regarding the tenure of permits over time, data from the BLM indicates that 45 percent of the permits in the Magic and Raft River resource areas have been held by the same operator for over 15 years, while 15 percent have been held for 5 years or less, and 22 percent have been held from 6 to 10 years. This general

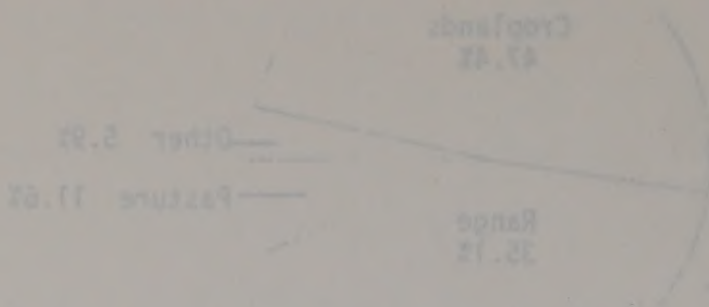


Figure 11. Use of land (excluding federal, urban, and small water) in Castle County, 1967. Source: Idaho Agricultural Statistics, 1972.

While no data was readily available concerning the size and distribution of Castle County permits, data from the Bureau of Land Management National Forest can be used to provide some insight. For example, the data in Table 2 indicate that most operators in the Magic and Raft River resource areas (primarily Castle County) are permitted to graze fewer than 200 cattle. The average sheep operator seems to be much larger, however. For example, the average sheep operator is permitted to graze nearly twice as many AUMs of forage with a herd that is more than twice as large (2,386 ± 2 is approximately 477 animal units) as the average cattle operator's. This same general trend also holds for 75 permits--i.e., sheep permits are larger than cattle permits. The 75 data (Table 3) also indicate that the average size of the permits have tended to increase over time, particularly since the mid 1960's. While no data are available regarding the tenure of permits over time, data from the BLM indicates that 42 percent of the permits in the Magic and Raft River resource areas have been held by the same operator for over 15 years, while 15 percent have been held for 5 years or less, and 32 percent have been held from 6 to 10 years. This general

Table 2. Size Distribution of cattle and sheep permits in the Magic and Raft River resource areas, Burley District, BLM, 1978.

	No. of Operators	Average No. of head Per Operator	Average No. of AUMs Per Operator
Cattle & Horses (No. animals)			
1 - 25	26	15	42
26 - 50	33	38	92
51 - 100	49	76	219
101 - 200	50	139	358
201 - 350	20	261	984
351 - 500	11	423	925
501 - 1,000	7	686	1,736
1,001 - 5,000	6	1,551	4,792
Total	202	180	512

Sheep & Goats (No. animals)			
1 - 500	1	500	50
501 - 1,000	1	1,000	74
1,001 - 2,500	5	1,839	860
2,501 - 5,000	4	3,100	1,135
5,001 - +	1	5,520	2,211
Total	12	2,384	932

Permit Size			
0	5		
1 - 100	67		51
101 - 500	95		241
501 - 1,000	21		722
1,001 - 2,000	19		1,300
2,001 - 3,000	4		2,560
3,001 - 4,000	3		3,484
4,001 - 5,000	2		4,811
5,001 - 15,000	1		5,556
Total	207		403

Table 2. Size Distribution of cattle and sheep herds in the Magic and Ratt River resource areas, Burley District, B.M., 1978.

Cattle & Horses (No. animals)		No. of Operators	Average No. of head per Operator	Average No. of AUs per Operator
1 - 25	58	12	45	45
26 - 50	33	38	95	95
51 - 100	49	38	219	219
101 - 200	50	139	328	328
201 - 350	20	287	884	884
351 - 600	17	453	958	958
601 - 1,000	7	686	1,736	1,736
1,001 - 2,000	6	1,521	4,505	4,505
Total	205	180	575	575
Sheep & Goats (No. animals)				
1 - 500	1	200	80	80
501 - 1,000	1	1,000	76	76
1,001 - 2,500	6	1,838	880	880
2,501 - 5,000	4	3,100	1,132	1,132
5,001 - 10,000	1	2,650	2,511	2,511
Total	13	5,384	535	535
Farm 212				
1 - 100	2	21	21	21
101 - 500	22	241	241	241
501 - 1,000	21	255	255	255
1,001 - 2,000	19	1,300	1,300	1,300
2,001 - 3,000	4	2,560	2,560	2,560
3,001 - 4,000	3	3,461	3,461	3,461
4,001 - 5,000	2	4,811	4,811	4,811
5,001 - 10,000	1	8,522	8,522	8,522
Total	207	403	403	403

Table 3. Use of Sawtooth National Forest lands, 1950-1975.

		No. of Permits	No. of Animals		Animal Months		Actual Animals Per Permit	AMs Permitted Per Permit	AMs Actual Per Permit	Permitted AMs Per Animal	Actual AMs Per Animal
			Permitted	Actual	Permitted	Actual					
Cattle & Horses											
Forest	1975	209	25,094	24,742	98,571	94,998	118.4	471.6	454.5	3.92	3.83
	1970	222	20,635	20,522	78,073	77,035	92.4	351.7	347.0	3.78	3.75
	1965	240	19,123	19,199	74,455	68,619	80.0	310.23	285.9	3.89	3.57
	1960	251	17,643	17,318	67,374	60,333	69.0	268.4	240.4	3.82	3.48
	1955	286	19,147	19,506	76,926	69,607	68.2	269.0	243.4	4.02	3.57
	1950	303	23,660	24,619	106,299	94,498	81.3	350.8	311.9	4.49	3.84
Cassia County											
	1975	127	NA	11,238	NA	47,215	88.5	NA	371.8	NA	4.20
	1970	163	10,404	10,388	40,856	40,891	63.7	250.7	250.9	3.92	3.90
	1965	153	9,998	9,406	38,657	35,498	61.5	252.7	232.0	3.87	3.77
	1960	NA	9,369	8,738	33,769	31,277	NA	NA	NA	3.60	3.58
	1955	NA	9,775	9,733	38,410	35,709	NA	NA	NA	3.93	3.67
	1951*	NA	8,570	8,566	35,221	34,700	NA	NA	NA	4.11	4.05
Sheep & Goats											
Forest	1975	29	75,061	62,045	232,369	187,775	2,139.5	8,012.7	6,475.0	3.09	3.03
	1970	44	87,178	92,284	241,916	222,851	2,097.7	5,498.0	5,065.0	2.78	2.41
	1965	57	92,059	89,005	280,844	245,877	1,561.5	4,927.0	4,314.0	3.05	2.76
	1960	64	128,039	129,111	361,972	336,567	2,017.4	5,655.0	5,259.0	2.83	2.61
	1955	102	149,020	133,824	437,826	361,286	1,312.0	4,292.0	3,542.0	2.94	2.70
	1950	118	255,091	245,274	817,859	687,017	2,078.6	6,931.0	5,822.0	3.21	2.80

Table 3. Use of Sawtooth National Forest lands, 1950-1975. (continued)

	No. of Permits	No. of Animals		Animal Months		Actual Animals Per Permit	AMs Permitted Per Permit	AMs Actual Per Permit	Permitted AMs Per Animal	Actual AMs Per Animal
		Permitted	Actual	Permitted	Actual					
Cassia County										
1975	18	NA	17,386	NA	58,992	965.9	NA	3,277.0	NA	3.40
1970	22	25,724	23,382	75,089	71,198	1,062.8	3,413.0	3,236.0	2.91	3.04
1965	27	32,205	34,344	97,646	88,537	1,272.0	3,616.0	3,279.0	3.03	2.58
1960	34	34,871	33,701	99,221	95,206	991.0	2,918.0	2,800.0	2.84	2.83
1955	NA	32,193	30,808	101,228	89,858	NA	NA	NA	3.14	2.92
1951*	NA	31,386	30,491	104,731	88,109	NA	NA	NA	3.34	2.89

NA = Not Available

*Data for some allotments were not available

stability may not reflect the changes in BLM use, however, as many of the changes occurred more than 15 years ago (before 1963).

While complete and detailed records are not available which indicated what changes have occurred in the use of federal lands by Cassia County permittees, the data in Tables 4 and 5 indicate the following general conclusions:

1. Use of Forest Service lands was relatively constant (Table 4) during the 1950-75 period, while use of BLM lands declined by more than 30 percent (Table 5). This change represented nearly a 20 percent reduction in the use of federal lands by Cassia County permittees during this period.
2. The general increase in the use of FS lands by Cassia County permittees is not indicative of the pattern of use of the Sawtooth National Forest lands by all permittees--i.e., Cassia County permittees now obtain approximately 45 percent of the forage available from Sawtooth forest lands, which compare to less than 25 percent in 1950. This indicates that rather large adjustments have occurred in other areas administered by the Sawtooth National Forest.^{5/}
3. The data in Table 3 indicate that the size of the average sheep permit declined during the 50's and 60's, but the average permit size has increased since that time. Furthermore, the average size of sheep permits is more than twice as large as the average size of cattle permits (Table 3). Furthermore, records at

^{5/} Forest Service records indicate that most of these adjustments have occurred in the Ketchum area (primarily Blaine and Camas Counties), and in the portions of the Sawtooth National Forest used by permittees from Utah.

possibly may not reflect the changes in BLM use, however, as many of the changes occurred more than 15 years ago (before 1953).

While complete and detailed records are not available which indicate what changes have occurred in the use of federal lands by Cassia County residents, the data in Tables 4 and 5 indicate the following general conclusions:

1. Use of forest service lands was relatively constant (Table 4) during the 1950-75 period, while use of BLM lands declined by more than 50 percent (Table 5). This change represented nearly a 50 percent reduction in the use of federal lands by Cassia County residents during this period.
2. The general increase in the use of 75 lands by Cassia County residents is not indicative of the pattern of use of the Sandoz National Forest lands by all residents--i.e., Cassia County residents now obtain approximately 45 percent of the timber and fuels from Sandoz National Forest lands, which compare to less than 25 percent in 1950. This indicates that rather large adjustments have occurred in other areas administered by the Sandoz National Forest.

3. The data in Table 3 indicate that the size of the average sheep permit declined during the 50's and 60's, but the average permit size has increased since that time. Furthermore, the average size of sheep permits is now twice as large as the average size of cattle permits (Table 3). Furthermore, records at

4. Forest Service records indicate that most of these adjustments have occurred in the Sandoz area (primarily Sandoz and Cassia Counties), and in the portion of the Sandoz National Forest used by residents from that area.

Table 4. Actual use of Sawtooth National Forest lands, 1950-1975.

	1975 [*]	1970	1965	1960	1955	1950 [*]
Forest (AUMs)						
Cattle & Horses	94,998	77,035	68,619	60,333	69,607	94,498
Sheep & Goats	37,555	44,570	49,175	67,313	72,257	137,403
TOTAL	132,553	121,605	117,494	127,646	141,864	231,901
Cassia County Permittees (AUMs)						
Cattle & Horses	47,215	40,891	35,498	31,277	35,709	34,700
Sheep & Goats	11,798	14,239	17,707	19,041	17,971	17,622
TOTAL	59,013	55,130	53,205	50,318	53,680	52,322
Cassia County as % of Total						
Cattle & Horses	50	53	52	52	51	37
Sheep & Goats	31	32	36	28	25	13
TOTAL	45	45	45	39	38	23

* 1976 data for the forest total was used

** Cassia County data is for 1951.

Table 5. Estimated AUMs of use on BLM lands by Cassia County livestock permittees, 1950 to present.

Planning Unit or Allotment	Use Before Change	Current Use	Year of Change
West Cassia			
Artesian	4,478	2,244	1958
Goose Creek	20,113	8,043	1956
Churchill	<u>6,253</u>	<u>4,589</u>	1956
SUBTOTAL	30,844	14,876	
Cotterell			
Declo Hills	1,637	937	?
Cotterell	6,028	4,965	?
Jim Sage	11,941	5,988	1960
E-4	3,322	2,081	1960
Junction	<u>2,714</u>	<u>1,416</u>	1956
SUBTOTAL	25,642	15,387	
Sublette	24,941	24,446	
TOTAL	81,427	54,709	

Table 2. Estimated loss of use on BLM lands by Cassia County livestock permittees, 1950 to present.

Planning Unit or Allotment	Use Before Change	Current Use	Year of Change
West Cassia			
Archer	4,478	3,366	1958
Good Creek	50,113	8,043	1958
Churchill	8,553	4,588	1958
SUBTOTAL	30,644	14,578	
Eastern			
Deer Mtn	1,637	837	1
Churchill	8,050	4,888	1
Jim Sage	11,941	5,888	1960
E-4	3,325	2,091	1960
Juniper	3,716	1,416	1958
SUBTOTAL	25,642	15,381	
SUBTOTAL	56,286	29,959	
TOTAL	81,453	54,702	

Table 6. Approximate use of BLM and Forest Service lands by permittees from Cassia County.

Year	AUMs of Use			Use as Percent of 1951 Level
	BLM	FS	Total	
1951	81,427	52,322	133,749	100
1955	81,427	53,680	135,107	101
1960	54,709	50,318	105,027	79
1965	54,709	53,205	107,914	81
1970	54,709	55,130	109,839	82
1975	54,709	59,013	133,722	85

Table B. Approximate use of BLM and Forest Service lands by permittees from Cassia County.

Year	Acre of use		Use as Percent of 1957 level
	BLM	Total	
1957	81,431	133,742	100
1958	81,437	138,707	101
1960	84,709	162,027	129
1962	84,708	167,014	121
1970	84,708	109,829	82
1972	84,708	133,722	82

the FS indicate that most sheep permittees own more than one permit. This would indicate that the average sheep operation is much larger than is the average cattle ranch. This fact is also borne out by the data in Table 2. These data indicate that most sheep operations in the Burley district (BLM) were permitted to graze from one to five thousand sheep. This number would be equivalent to 200 to 1,000 head of cattle. Most cattle operators were permitted to graze fewer than 200 head of cattle. While no data are available which can be used to indicate what changes in size have occurred over time, these data suggest that small sheep operators may have been forced out of business, while small cattle permittees have generally survived.

4. The data in Table 3 indicate that the relatively small adjustments in the use of Forest Service lands by cattle have occurred as a result of reductions in numbers, as well as season of use. The average season of use and number of animals have increased or decreased at approximately the same rates over time. Decreased use of FS lands by sheep has occurred primarily as a result of decreased numbers; however, the season of use has generally increased, while numbers have steadily declined.

While the reductions in the use of BLM lands may have been partially affected by increases in the use of FS lands by Cassia County permittees, the data in Table 6 indicate that by 1960 the total use of federal lands was more than 20 percent less than the level in 1951. This reduction would be expected to affect the use of private lands in the county. The data in Tables 7, 8 and 9 suggest, however, that any adjustments that occur-

the 12 indicate that most sheep permittees own more than one permit. This would indicate that the average sheep operation is much larger than the average cattle ranch. This fact is also borne out by the data in Table I. These data indicate that most sheep operations in the Burley district (BLM) were permitted to graze from one to five thousand sheep. This number would be equivalent to 200 to 1,000 head of cattle. Most cattle operators were permitted to graze fewer than 200 head of cattle. While no data are available which can be used to indicate what changes in size have occurred over time, these data suggest that small sheep operators may have been forced out of business, while small cattle permittees have generally survived.

The data in Table 2 indicate that the relatively small adjustments in the use of Forest Service lands by cattle have occurred as a result of reductions in numbers, as well as season of use. The average season of use and number of animals have increased or decreased at approximately the same rates over time. Decreased use of FS lands by sheep has occurred primarily as a result of decreased numbers; however, the season of use has generally increased, while numbers have steadily declined.

While the reduction in the use of BLM lands may have been partially affected by increases in the use of FS lands by Cassia County permittees, the data in Table 3 indicate that by 1950 the total use of Federal lands was more than 50 percent less than the level in 1921. This reduction would be expected to affect the use of private lands in the county. The data in Tables 4, 5 and 6 suggest, however, that any adjustments that occur-

Table 7. Agricultural statistics for Idaho, 1950-1974.

	1950	1954	1959	1964	1969	1974
Number of farms	40,284	38,740	33,670	29,661	25,661	23,680
Average size of farms	328	370	452	516	566	603
Proportion of land in farms	25	27	29	30	27	27
Irrigated land in farms (acres)x 1,000	2,137	2,325	2,576	2,802	2,761	2,859
Cropland harvested (acres)x 1,000	3,648	3,728	3,832	3,935	3,955	4,531
Cropland used for pasture (acres)x 100	485	545	663	696	967	873
Other pasture (acres)x 1,000	5,625	6,712	7,074	7,434		

Number of full-time operators	25,947	24,231	20,118	17,550	15,396	14,609
Full-time as % of all operators	64	62	60	59	60	62

No. cattle and calves x 100	948	1,357	1,380	1,603	1,731	1,917
No. cows and heifers per farm	12	16	20	29	39	52
No. sheep and lambs: x 100	1,509	1,198	1,241	995	864	660
per farm	332	216	237	398	372	376

Crops:						
Wheat acres x 1,000	1,470	1,155	1,087	1,041	960	1,408
Barley acres x 1,000	304	541	500	464	659	725
Oats acres x 100	158	174	127	85	82	39
All hay: acres x 1,000	1,050	1,113	1,159	1,244	1,107	1,232
tons x 1,000	2,316	2,729	2,863	3,391	3,337	3,760
Alfalfa hay acres x 1,000	691	843	899	967	903	1,025
Wild hay acres x 1,000	143	121	98	101	85	83

Value of all products sold (x 100,000)		332	438	478	649	1,381
Livestock as % of total		16	45	44	54	37

Source: Census of Agriculture.

Table 5. Agricultural statistics for Idaho, 1950-1974

	1974	1969	1964	1959	1954	1950
Number of farms	40,384	38,740	37,870	39,661	39,661	37,610
Average size of farm	358	370	445	416	458	603
Proportion of land in farms	52	53	52	50	51	51
Irrigated land in farms (acres) x 1,000	5,137	5,352	5,378	5,803	5,781	5,859
Unirrigated land in farms (acres) x 1,000	3,648	3,758	3,835	3,892	3,922	4,631
Land used for pasture (acres) x 100	482	545	683	686	667	813
Other pasture (acres) x 1,000	6,652	6,715	7,074	7,434		
Number of full-time operators	52,947	54,531	50,118	47,520	47,386	44,609
Part-time as % of all operators	64	63	80	59	60	65
Value of cattle and calves x 100	948	1,327	1,380	1,603	1,731	1,917
Value of cows and heifers per farm	15	38	50	59	59	55
Value of sheep and lambs x 100	1,504	1,198	1,245	948	864	860
Value of other livestock per farm	335	516	537	398	375	376
Crops:						
Wheat acres x 1,000	1,430	1,128	1,047	1,047	985	1,405
Barley acres x 1,000	304	547	800	484	659	752
Oats acres x 100	183	174	173	82	85	39
All hay acres x 1,000	1,000	1,113	1,159	1,244	1,107	1,525
Alfalfa hay acres x 1,000	6,316	5,759	5,863	5,387	5,327	5,760
Other hay acres x 1,000	681	843	882	967	903	1,032
Value of all products sold (x 100,000)	163	157	28	101	86	83
Livestock as % of total	76	41	44	44	44	37

Source: Census of Agriculture.

Table 8. Agricultural statistics for Cassia County, Idaho, 1950-1974.

	1950	1954	1959	1964	1969	1974
Number of farms	1,248	1,225	1,142	978	902	865
Average size of farms	372	425	565	678	660	784
Proportion of land in farms	29	31.7	39.7	40.7	36.6	41.6
Irrigated land in farms (acres)x 1,000	41	107	146	190	178	203
Cropland harvested (acres)x 100	125	139	176	204	197	254
Cropland used for pasture (acres)	12,581	39,771	59,906	42,081	58,222	34,118
Other pasture (acres) x 1,000	237	257	282	319		

Number of full-time operators	811	737	691	554	532	538
Full-time as % of all operators	65	60	61	57	59	62

No. cattle and calves x 1,000	43	57	65	69	80	109
No. cows and heifers per farm	16	22	25	42	49	75
No. sheep and lambs:	50,643	71,471	78,646	83,121	72,848	32,176
per farm	220	247	345	655	847	527

Crops:						
Wheat acres	44,957	45,844	53,643	47,910	47,976	81,010
Barley acres	6,088	13,885	8,277	15,105	25,744	36,314
Oats acres	1,648	1,845	1,342	1,800	1,540	535
All hay: acres	45,937	42,547	53,913	61,714	54,505	63,544
tons x 1,000	120	128	151	194	187	231
Alfalfa hay acres	34,330	36,561	46,003	53,113	47,408	54,056
Wild hay acres	7,845	4,537	2,525	5,059		

Value of all products sold (x 1,000)	11,862	13,893	22,189	32,816	35,243	99,170
Livestock as % of total	40	35	28	38	51	66

Source: Census of Agriculture.

Table A. Agricultural Statistics for Cassia County, Idaho, 1920-1974

	1920	1924	1928	1932	1936	1940	1944	1948	1952	1956	1960	1964	1968	1972
Number of farms	1,548	1,322	1,142	978	902	862								
Average size of farm	375	458	588	878	880	784								
Proportion of land in farms	59	39.7	40.7	38.6	41.8									
Investigated land in farms (acres) x 1,000	41	107	148	190	174	503								
Crop and harvested (acres) x 100	122	139	178	204	197	524								
Land used for pasture (acres)	12,881	29,771	29,008	47,081	28,525	34,118								
Other pasture (acres) x 1,000	237	527	585	379										
Number of full-time operators	871	737	697	584	525	538								
Full-time as % of all operators	82	80	81	81	81	85								
No. cattle and calves x 1,000	42	27	62	69	80	100								
No. cows and heifers per farm	18	32	32	42	49	72								
No. sheep and lambs	50,643	77,431	78,646	83,151	75,848	75,778								
Per farm	320	587	342	857	867	527								
Crops:														
Wheat acres	44,925	42,844	23,842	47,810	47,970	61,010								
Barley acres	6,088	13,885	8,277	12,702	22,704	36,714								
Oats acres	7,648	7,842	7,342	7,800	7,840	232								
All hay acres	42,931	45,947	43,912	47,714	54,702	62,844								
Alfalfa hay acres	150	128	187	184	187	231								
Other hay acres	34,330	36,287	40,003	23,713	41,408	24,026								
Value of all products sold (x 1,000)	17,882	13,803	22,188	35,916	36,247	39,770								
Livestock as % of total	40	32	28	30	21	66								

Source: Census of Agriculture

Table 9. Agricultural statistics for Oneida County, Idaho, 1950-1974.

	1950	1954	1959	1964	1969	1974
Number of farms	543	485	440	438	396	366
Average size of farms	611	678	808	840	861	911
Proportion of land in farms	43.5	43.1	46.6	48.2	44.7	43.7
Irrigated land in farms (acres)	19,212	19,915	21,906	23,398	25,613	25,281
Cropland harvested (acres)x 1,000	114	115	120	120	106	145
Cropland used for pasture (acres)	7,334	6,364	8,373	15,631	16,926	15,579
Other pasture (acres)x 1,000	91	103	102	121		

Number of full-time operators	329	279	244	223	209	209
Full-time as % of all operators	61	58	55	51	53	57

No. cattle and calves	18,481	23,760	25,520	29,588	30,011	33,461
No. cows and heifers per farm	23	31	39	58	68	83
No. sheep and lambs:	10,776	11,090	17,544	15,359	8,493	4,641
per farm	161	127	351	452	250	185

Crops:						
Wheat acres	84,722	63,904	61,653	64,246	58,060	85,866
Barley acres	7,221	25,118	30,066	25,996	22,171	29,655
Oats acres	558	868	1,224	1,182	1,924	469
All hay: acres	19,744	21,024	24,239	27,571	21,380	26,422
tons	37,478	37,927	40,082	59,262	57,329	69,009
Alfalfa hay acres	12,549	13,599	16,725	18,358	14,856	
Wild hay acres	6,451	6,248	5,860	7,143		

Value of all products sold (x 1,000)	4,718	4,254	5,342	4,834	5,525	10,907
Livestock as % of total	24	25	36	32	45	26

Source: Census of Agriculture.

Table 9 - Agricultural statistics for Deane County, Idaho, 1950-1974

	1950	1954	1958	1962	1966	1970
Number of farms	583	482	440	436	396	366
Average size of farms	611	678	800	840	867	911
Percentage of land in farms	41.8	43.7	46.6	48.5	48.7	49.7
Unimproved land in farms (acres)	10,515	10,912	21,906	23,338	25,613	28,201
Land planted harvested (acres) x 1,000	114	115	130	130	106	105
Land used for pasture (acres)	7,334	8,366	8,323	12,631	16,956	17,518
Other pasture (acres) x 1,000	93	103	105	191		
Number of full-time operators	353	339	344	353	309	309
Full-time as % of operators	61	58	58	51	53	57
Per cattle and calves	10,480	23,780	22,320	20,080	30,070	33,481
Per cows and heifers per farm	23	31	39	55	65	83
Per sheep and lambs	10,736	17,080	17,044	15,369	8,483	4,643
per farm	181	157	391	457	220	126
Crops:						
Wheat acres	26,732	63,904	61,623	64,746	50,000	52,888
Barley acres	7,357	22,318	30,106	25,986	35,171	29,229
Oats acres	888	888	1,324	1,185	1,924	400
Alfalfa hay acres	18,764	21,054	24,739	23,774	21,380	20,455
Other hay acres	37,418	37,857	40,085	50,285	57,359	63,004
Alfalfa hay acres	12,240	13,289	16,752	18,028	14,859	
Other hay acres	6,421	6,568	8,080	7,183		
Value of all products sold (x 1,000)	4,718	4,254	5,342	4,824	5,652	10,007
Livestock as % of total	24	52	35	35	45	56

Source: Census of Agriculture.

red were generally not different from trends for the state or Oneida^{6/} County. The following changes suggest, however, that some private land adjustments in Cassia County may have been associated with reductions in the use of BLM lands in the late 50's.

1. The average number of cows and heifers nearly doubled between 1959 and 1960 in Cassia County, while the average for the state did not increase until later. However, the average size in Oneida also increased between 1959 and 1964, which suggests that adjustments in this general area preceded state adjustments.
2. The average number of sheep per farm increased much faster in Cassia County than it did in the state, or in Oneida County, which suggests that sheep operators may have been affected by the change in BLM use more than were cattlemen.

In conclusion, small differences between the agricultural statistics for Cassia County, when compared to Oneida County or to the state, suggest that the reduced use of federal land probably had little affect on the use of private lands in Cassia County. The only possible exception may have been a tendency to increase the size of sheep operations in the county.

Bear Lake County, Idaho

Bear Lake County is located in the southeastern corner of Idaho. Early records indicate that Forest Service lands in this general area were used by migratory sheep operators for summer pasture. This pattern of use still exists to some degree, because many sheep operators which

^{6/}Oneida County borders Cassia County to the east, and is similar to Cassia with respect to topography, climate, and patterns of use. It is, however, generally more agrarian, with somewhat greater emphasis on range livestock production. Furthermore, there is less irrigation and no cities are found within its borders which are as large as Burley (Cassia County). In short, Oneida is less densely populated.

and were generally not different from trends for the state or Nevada County. The following changes suggest, however, that some private land adjustments in Nevada County may have been associated with reductions in the use of BLM lands in the late 1970's.

1. The average number of cows and heifers nearly doubled between 1955 and 1980 in Nevada County, while the average for the state did not increase until later. However, the average size in Nevada also increased between 1955 and 1980, which suggests that adjustments in this general area preceded state adjustments.
2. The average number of sheep per farm increased much faster in Nevada County than it did in the state, or in Nevada County, which suggests that sheep operations may have been affected by the change in BLM use more than were cattle.

In conclusion, small differences between the agricultural statistics for Nevada County, when compared to Nevada County or to the state, suggest that the reduced use of federal land probably had little effect on the use of private lands in Nevada County. The only possible exception may have been a tendency to increase the size of sheep operations in the county.

Nevada County, Idaho

Nevada County is located in the southeastern corner of Idaho. Early records indicate that Forest Service lands in this general area were used by privately owned operators for summer pasture. This pattern of use still exists to some degree, because many sheep operators which

Nevada County borders Cassia County to the east, and is similar to Cassia with respect to topography, climate, and patterns of use. It is, however, generally more arid, with somewhat greater emphasis on range livestock production. Furthermore, there is less irrigation and no cities are found within its borders which are as large as Burley (Cassia County). In short, Nevada is less densely populated.

graze Caribou Forest lands in southeastern Idaho and northeastern Utah have base properties to the south and west.

Range represents the primary use of land in Bear Lake County (Figure 12). Most of the land in the county is privately owned (approximately 50 percent), while 45.8 percent is owned by the federal govern-

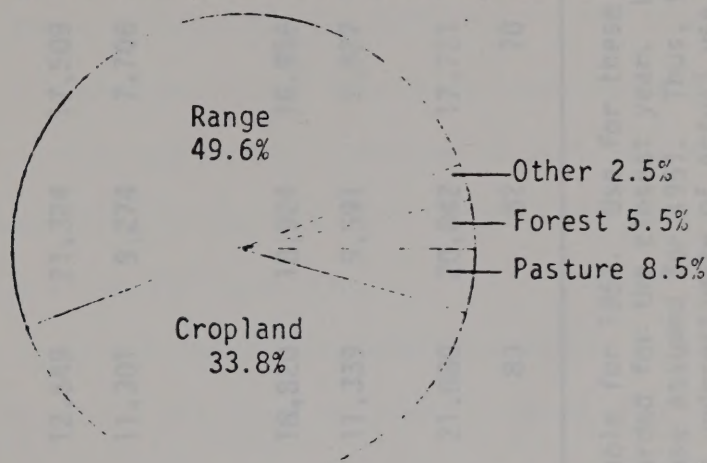


Figure 12. Use of land in Bear Lake County, 1967.
Source: Idaho Agricultural Statistics, 1972.

ment. However, unlike Cassia, most (81%) of the federal land in Bear Lake County is administered by the Caribou National Forest. Furthermore, all of the BLM land in Bear Lake County is in small, scattered tracts (Section 15 leases) that had not been surveyed until the summer of 1977.

As one would expect from the preceding paragraph, use of BLM lands over time has not been altered by agency action. The use of BLM lands may have changed over time, but no records of use are available for this area. It is therefore assumed that use of BLM lands has remained at the current permitted level over the period of concern (1950 to present).

While use of BLM lands has probably not varied over time, use of FS lands by Bear Lake permittees shows considerable variation (Table 10). These data indicate that the use of FS lands was reduced approximately

graze. Caribou Forest lands in southeastern Idaho and northeastern Utah have been transferred to the south and west. Range represents the primary use of land in Bear Lake County (Figure 12). Most of the land in the county is privately owned (approximately 50 percent), while 48.5 percent is owned by the federal government.

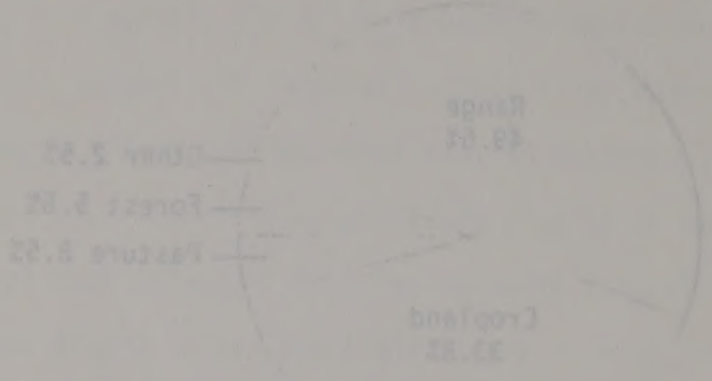


Figure 12. Use of land in Bear Lake County, 1967.
Source: Idaho Agricultural Statistics, 1972.

most, however, within the Caribou Forest, most (81%) of the federal land in Bear Lake County is administered by the Caribou National Forest. Furthermore, all of the BLM land in Bear Lake County is in small, scattered tracts (Section 12 forest) that had not been surveyed until the summer of 1977. As one would expect from the preceding paragraph, use of BLM lands over time has not been altered by agency action. The use of BLM lands may have changed over time, but no records of use are available for this area. It is therefore assumed that use of BLM lands has remained at the current permitted level over the period of concern (1950 to present). While use of BLM lands has probably not varied over time, use of FS lands by Bear Lake permittees shows considerable variation (Table 10). These data indicate that the use of FS lands was reduced approximately

Table 10. Use of Forest Service lands by operators from Bear Lake County, 1951-1975.

	1951 [*]	1956	1960	1965	1970	1975
Animal months permitted						
Cattle & Horses			12,649	21,324	17,509	17,479
Sheep & Goats		13,589	11,301	9,274	7,706	9,870
Animal months actual						
Cattle & Horses	26,578	22,564	18,820	18,924	16,956	14,527
Sheep & Goats		13,515	11,339	9,591	2,827	8,560
Estimated animal unit months of actual use	29,281	25,267	21,080	20,842	17,721	16,239
Use as % of 1956 level	116	100	83	82	70	64

* Data for several cattle allotments were not available for 1951. Use for these allotments in 1951 was assumed to be equal to the amount recorded for the closest year. Use by sheep was not available until 1956, the level of use assumed for 1951. Thus, the total amount of use in 1951 (29,281 AUMs) is probably an underestimate of actual use.

45 percent between 1951 and 1975, with reductions in excess of 10% between most five-year intervals.

Information for Forest Service permits for 1977 and 1975 indicate that most are generally small (Table 11). These data also indicate that while the average Bear Lake County operator is allowed to graze 42 cattle and 745 sheep, there is considerable variation in the size of these operations (the standard deviation is greater than the mean). Furthermore, the average Bear Lake sheep operation is much smaller than is the average sheep operation in the National Forest lands, while the average cattle ranch is about the same size.

While individual sheep allotments are generally common on the Caribou and BLM lands, every FS cattle allotment is used in common (cattle owned by more than one operator are permitted to graze in an allotment)--the number of operators per allotment varied from 5 to 44 during 1975.

Similar data concerning the size of BLM permits in Bear Lake County also indicate that most permits are relatively small (Table 14)--less than 100 AUMs were licensed per permit. The primary reason why most BLM permits are very small in this area is due to the fact that most BLM lands are small, scattered parcels which are essentially part of a private operation.

No data are available which can be used to trace changes in the size of FS or BLM permits over time. Therefore, it is impossible to determine what impact the reductions in FS use had on permittee size or distribution. Allotment files indicate, however, that a large, but unknown portion of the permits have been owned by the same person throughout this period.

45 percent between 1951 and 1975, with reductions in excess of 100 percent most five-year intervals.

Information for Forest Service permits for 1971 and 1975 indicate that most are generally small (Table B). These data also indicate that while the average Bear Lake County operator is allowed to graze 45 cattle and 745 sheep, there is considerable variation in the size of these operations (the standard deviation is greater than the mean). Furthermore, the average Bear Lake sheep operation is much smaller than is the average sheep operation in the National Forest lands, while the average cattle ranch is about the same size.

While individual sheep allotments are generally common on the Carbon and BLM lands, every 45 cattle allotment is used in common (cattle owned by more than one operator are permitted to graze in an allotment)--the number of operators per allotment varied from 2 to 44 during 1975.

Similar data concerning the size of BLM permits in Bear Lake County also indicate that most permits are relatively small (Table 1a)--less than 100 acres were licensed per permit. The primary reason why most BLM permits are very small in this area is due to the fact that most BLM lands are small, scattered parcels which are essentially part of a private operation.

No data are available which can be used to trace changes in the size of 45 or BLM permits over time. Therefore, it is impossible to determine what impact the reductions in 45 use had on permit size or distribution. Allotment files indicate, however, that a large, but unknown portion of the permits have been owned by the same person throughout this period.

Table 11. Size and distribution of Bear Lake County and Caribou National Forest Service, 1977.

	Bear Lake		Caribou Forest
	1977	1975	1977
<u>Sheep Operators</u>			
Number of operators permitted to graze:			
1-1,000 head	5		10
1,000-2,500 head	2		13
2,500 or more			15
Ave. no. of animals permitted per operator	745		2,570
Standard deviation	760.6		1,984
Ave. no. of animal months permitted per operator	1,248		4,841
Standard deviation	1,669		4,408

<u>Cattle Operators</u>			
Number of operators permitted to graze:			
1-40 head	84		94
40-100 head	23		30
100-200 head	7		10
200 or more	4		4
Ave. no. of animals permitted per operator	42.4	40.6	44.7
Standard deviation	56.5	59.4	55.2
Ave. no. of animal months permitted per operator		113.3	
Standard deviation		194.6	

The relatively large reduction in the use of FS lands would be expected to have some effect on the use of private lands in the county. In fact, the following trends indicate that the reductions in the use of FS lands by livestock owned by ranchers from Bear Lake County may have affected the use of privately owned resources (See Tables 12 and 13).

1. The percentage of full-time operators in Bear Lake declined.

Table 14. Size and distribution of use of Bear Lake County BLM permits, 1977.

	Cattle	Sheep	Cattle & Sheep	Total
Number of permits	48	1	3	52
AUMs of licensed use	3,765	11	718	4,494
Ave. No. of AUMs licensed	78.4	11	718	86.4
Standard Deviation	122.9	--	387	146.1
Ave. No. of Animals	20.4	15		
Standard Deviation	30.1	--		

and welfare per farm. These trends suggest that reductions in the use of FS lands may have retarded the growth of the cattle industry in Bear Lake County.

3. While cattle numbers did not increase as rapidly in Bear Lake as they did in the other counties or the state, sheep numbers declined at a less rapid rate. However, since sheep operations were relatively small (small number of sheep per ranch), which

Bear Lake County borders Lake County to the north, while Idaho is just west of Bear Lake County. In general, the characteristics of these two counties represent a transition from west to east in terms of climate--Idaho is drier, while Bear Lake County received more rainfall, and is forested like much of Bear Lake County.

Table 14. Size and distribution of use of Bear Lake County BLM permits.
1977.

Number of permits	Cattle	Sheep	Cattle & Sheep	Total
Area of licensed use	3,752	11	719	4,481
Area, No. of acres licensed	78.4	11	718	80.4
Standard deviation	125.8	--	267	146.1
Area, No. of holdings	20.4	12		
Standard deviation	30.1	--		

The relatively large reduction in the use of FS lands would be expected to have some affect on the use of private lands in the county. In fact, the following trends indicate that the reductions in the use of FS lands by livestock owned by ranchers from Bear Lake County may have affected the use of privately owned resources (See Tables 12 and 13).

1. The percentage of full-time operators in Bear Lake declined, while the percentage of full-time operators stayed relatively constant in Caribou,^{7/} Oneida, and Cassia Counties, as well as the state. This indicates that ranchers in Bear Lake may have sought more "off-farm" work as a result of the FS reductions.
2. While the number of cattle and calves increased in Bear Lake County, the rate was not as great as it was in Oneida, Cassia, and Caribou, or the state. In fact, the number of cattle and calves remained essentially constant from 1945 through 1969 in Bear Lake County, while numbers in all the other areas increased. This reduced trend was also true for the average number of cows and heifers per farm. These trends suggest that reductions in the use of FS lands may have retarded the growth of the cattle industry in Bear Lake County.
3. While cattle numbers did not increase as rapidly in Bear Lake as they did in the other counties or the state, sheep numbers declined at a less rapid rate. However, most sheep operations were relatively small (small number of sheep per farm), which,

^{7/}Caribou County borders Bear Lake County to the north, while Oneida is just west of Bear Lake County. In general, the characteristics of these two counties represent differences from Bear Lake in opposite directions--Oneida is dryer, while Caribou County receives more rainfall, and is forested like much of Bear Lake County.

The relatively large reduction in the use of FS lands would be expected to have some effect on the use of private lands in the county. In fact, the following trends indicate that the reductions in the use of FS lands by livestock owned by ranchers from Bear Lake County may have affected the use of privately owned resources (See Tables 12 and 13).

1. The percentage of full-time operators in Bear Lake declined, while the percentage of full-time operators stayed relatively constant in Carbon, ^WOneida, and Cassia Counties, as well as the state. This indicates that ranchers in Bear Lake may have sought more "off-farm" work as a result of the FS reductions.

2. While the number of cattle and calves increased in Bear Lake County, the rate was not as great as it was in Oneida, Cassia, and Carbon, or the state. In fact, the number of cattle and calves remained essentially constant from 1945 through 1969 in Bear Lake County. While numbers in all the other areas increased. This reduced trend was also true for the average number of cows and weaners per farm. These trends suggest that reductions in the use of FS lands may have retarded the growth of the cattle industry in Bear Lake County.

3. While cattle numbers did not increase as rapidly in Bear Lake as they did in the other counties or the state, sheep numbers declined at a less rapid rate. However, meat sheep operations were relatively small (small number of sheep per farm), which

^WCarbon County borders Bear Lake County to the north, while Oneida is just west of Bear Lake County. In general, the characteristics of these two counties represent different distances from Bear Lake in opposite directions--Oneida is dryer, while Carbon County receives more rain-fall, and is forested like much of Bear Lake County.

Table 12. Agricultural statistics for Bear Lake County, Idaho, 1950-1974.

	1950	1954	1959	1964	1969	1974
Number of farms	712	759	636	516	480	484
Average size of farms	414	439	579	653	653	686
Proportion of land in farms	46.6	52.7	58.2	53.3	49.8	52.7
Irrigated land in farms (acres)	52,850	56,820	59,212	56,849	55,375	49,330
Cropland harvested (acres)	87,685	97,660	93,465	86,916	80,636	92,303
Cropland used for pasture (acres)	13,438	11,044	12,335	15,400	23,748	33,291
Other pasture (acres) x 1,000	151	184	225	199		

Number of full-time operators	501	525	374	298	277	300
Full-time as % of all operators	70	69	59	58	58	62

No. cattle and calves	28,816	30,364	32,621	30,746	30,180	41,132
No. cows and heifers per farm	19	21	28	37	47	61
No. sheep and lambs:	23,481	22,710	27,805	17,005	18,195	18,813
per farm	143	94	130	113	148	254

Crops:						
Wheat acres	24,125	22,519	16,681	16,399	18,714	20,603
Barley acres	8,403	15,615	14,821	11,444	11,689	13,075
Oats acres	2,281	2,414	1,186	626	1,229	677
All hay: acres	52,298	57,020	60,333	50,223	45,689	54,837
tons x 1,000	67	67	78	78	81	101
Alfalfa hay acres	15,596	19,188	22,451	18,458	21,800	
Wild hay acres	26,596	29,179	29,888	26,167		

Value of all products sold (x 1,000)	3,254	3,164	4,216	3,612	5,473	9,101
Livestock as % of total	52	45	57	48	78	68

Source: Census of Agriculture.

Livestock, at 2 of census	Value of all products sold (\$1,000)	1920 1930 1940 1950 1960 1970				
		25	42	53	48	78
Value of all products sold (\$1,000)		3,254	3,184	4,516	7,615	8,473
Wheat acres		24,152	25,218	16,681	16,308	18,714
Barley acres		8,403	12,612	14,871	11,444	11,686
Oats acres		5,381	5,414	7,186	456	1,328
All hay, acres		85,528	97,050	60,333	50,323	42,633
Alfalfa hay acres		12,886	18,188	25,451	18,458	21,800
Wild hay acres		28,286	29,179	29,888	28,761	
Swine, head		12,886	18,188	25,451	18,458	21,800
Cattle and calves		28,816	30,384	27,651	30,746	30,180
Cows and heifers per farm		19	21	28	37	47
Swine and hogs per farm		33,481	25,710	27,802	17,002	18,192
Other livestock		143	44	130	113	148
Number of full-time operators		50	60	69	28	28
Number of full-time operators		201	222	274	298	277
Other pasture (acres) x 1,000		121	184	222	199	
Acres used for pasture (acres)		13,438	17,044	12,332	19,400	23,748
Crop land harvested (acres)		81,682	97,660	93,462	86,916	92,302
Irrigated land in farms (acres)		25,820	26,620	29,712	26,849	22,312
Proportion of land in farms		46.8	22.7	28.5	21.3	49.8
Average size of farm		414	439	279	623	623
Number of farms		212	229	632	216	464

Table 13. Agricultural statistics for Caribou County, Idaho, 1950-1974.

	1950	1954	1959	1964	1969	1974
Number of farms	593	579	545	480	479	450
Average size of farms	699	889	1,052	1,215	1,619	1,267
Proportion of land in farms	37.1	46.0	51.3	52.2	65.2	54.3
Irrigated land in farms (acres)	41,360	41,451	51,832	64,322	64,450	63,313
Cropland harvested (acres) x 1,000	146	153	150	140	177	138
Cropland used for pasture (acres)	10,473	10,102	13,110	20,757	25,940	25,144
Other pasture (acres) x 1,000	140	233	282	294		

Number of full-time operators	356	328	260	233	289	272
Full-time as % of all operators	60	57	48	49	60	60

No. cattle and calves	23,819	30,602	30,809	33,121	32,521	45,366
No. cows and heifers per farm	22	32	42	55	64	86
No. sheep and lambs:	39,372	25,431	25,346	21,415	40,844	26,770
per farm	270	173	190	389	454	535

Crops:						
Wheat acres	62,921	49,755	46,651	43,891	38,793	44,144
Barley acres	48,097	59,571	63,714	50,179	58,721	82,511
Oats acres	2,008	3,022	1,832	1,190	2,390	1,677
All hay: acres	30,267	38,411	36,806	39,128	32,014	41,633
tons x 1,000	50	65	73	87	79	112
Alfalfa hay acres	14,677	20,098	25,040	25,225	22,480	
Wild hay acres	6,978	10,549	5,371	6,033		

Value of all products sold (x100)	6,442	6,353	7,488	8,428	11,550	25,410
Livestock as % of total	33	31	38	29	50	28

Source: Census of Agriculture.

Livestock as % of total
Value of all products sold (\$100)

6,445	6,353	7,458	8,458	11,350	52,410
33	31	38	54	50	58

Wild hay acres

6,978	10,549	2,271	6,073		
-------	--------	-------	-------	--	--

Alfalfa hay acres

14,677	50,000	52,040	52,552	53,460	
--------	--------	--------	--------	--------	--

tons x 1,000

All hay: acres

50	62	73	87	78	115
----	----	----	----	----	-----

Orchard acres

2,008	3,025	1,832	1,790	2,300	1,873
-------	-------	-------	-------	-------	-------

Barley acres

48,007	59,571	63,714	60,139	58,721	65,671
--------	--------	--------	--------	--------	--------

Wheat acres

62,951	48,752	46,651	43,091	38,723	44,744
--------	--------	--------	--------	--------	--------

Crops:

per farm

270	173	190	302	424	832
-----	-----	-----	-----	-----	-----

Hay, sheep and horses

38,725	52,431	52,346	51,476	40,844	56,770
--------	--------	--------	--------	--------	--------

Hay, cows and heifers per farm

55	35	43	55	64	86
----	----	----	----	----	----

Hay, cattle and calves

23,818	30,605	30,608	33,757	35,651	42,302
--------	--------	--------	--------	--------	--------

Full-time as % of all operators

60	57	48	49	60	60
----	----	----	----	----	----

Number of full-time operators

326	358	560	733	588	575
-----	-----	-----	-----	-----	-----

Other pasture (acres) x 1,000

140	533	585	594		
-----	-----	-----	-----	--	--

Crop land used for pasture (acres)

10,473	10,105	12,110	20,757	22,940	32,744
--------	--------	--------	--------	--------	--------

Crop land harvested (acres) x 1,000

148	153	150	140	177	138
-----	-----	-----	-----	-----	-----

Irrigated land in farms (acres)

41,380	41,451	51,802	64,325	64,480	63,713
--------	--------	--------	--------	--------	--------

Proportion of land in farms

37.7	48.0	51.3	51.5	82.5	84.3
------	------	------	------	------	------

Average size of farms

699	869	1,082	1,718	1,679	1,567
-----	-----	-------	-------	-------	-------

Number of farms

693	879	845	480	479	450
-----	-----	-----	-----	-----	-----

Table 13. Agricultural statistics for Carbon County, Idaho, 1950-1974

when combined with the small permit size (Table 11), indicates that these small operations may not have been greatly affected.

4. The relatively small growth in the livestock industry in Bear Lake is also reflected in the hay production of the county-- i.e., yields did not increase as rapidly, while acreage declined in Bear Lake relative to the other counties in Idaho.

While the preceding is not conclusive, the data for Bear Lake County suggest that the major impact of reductions in the use of FS lands may have been a reduction in the growth of the counties' cattle industry.

Rich County, Utah

Rich County is located in the northeastern corner of Utah, and borders both Wyoming and Idaho. It also borders Bear Lake County, Idaho to the south. In general, it is very similar to Bear Lake County. For example, the data in Figure 13 indicate that range is the dominant use of land in Rich county--most of the federal land is also used as range

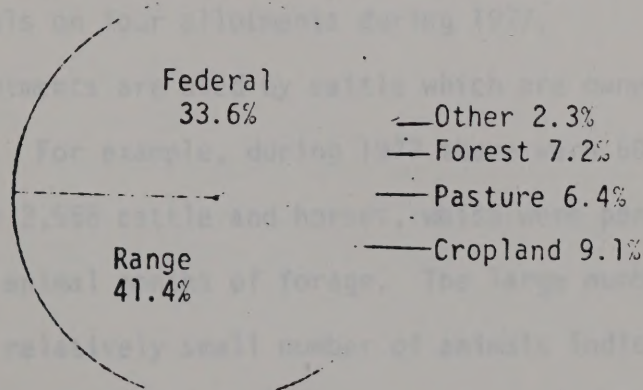


Figure 13. Use of land in Rich County, Utah, excluding urban and small water, 1967.
Source: Utah Agricultural Statistics, 1976.

or forest. One difference between these counties, however, stems from the fact that a larger portion of Bear Lake County is cropland than is Rich County. One other major difference between Bear Lake and Rich

when combined with the small percent size (Table II), indicates that these small quantities may not have been greatly affected. 4. The relatively small growth in the livestock industry in Bear Lake is also reflected in the hay production of the county--i.e., yields did not increase as rapidly, while acreage declined in Bear Lake relative to the other counties in Idaho. While the preceding is not conclusive, the data for Bear Lake County suggest that the major impact of reduction in the use of 75 lands may have been a reduction in the growth of the counties' cattle industry.

Rich County, Utah

Rich County is located in the northeastern corner of Utah, and borders both Wyoming and Idaho. It also borders Bear Lake County, Idaho to the south. In general, it is very similar to Bear Lake County. For example, the data in Figure 13 indicate that range is the dominant use of land in Rich County--most of the federal land is also used as range

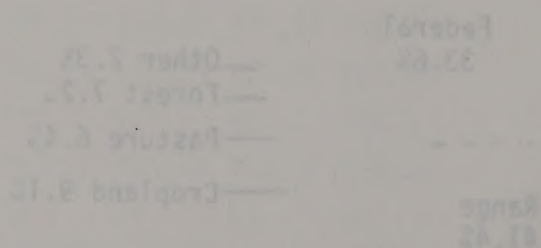


Figure 13. Use of land in Rich County, Utah, excluding urban and small water, 1957.
Source: Utah Agricultural Statistics, 1958.

or forest. One difference between these counties, however, stems from the fact that a larger portion of Bear Lake County is cropland than is Rich County. One other major difference between Bear Lake and Rich

counties concerns federal ownership. For example, Bear Lake County is generally administered by the FS, while Rich County has a relatively large acreage which is administered by the BLM. Furthermore, during 1976 BLM lands in Rich County were "blocked off" into single and common use allotments--twenty-six percent of Rich County was administered by the BLM, while approximately 12 percent was administered by the FS. The major difference between these two counties is reflected by the use of federal lands over time (Tables 15 and 16). These data indicate that relatively large reductions occurred on FS and BLM lands used by Rich County operators in the early 60's. While these data do not indicate what the total change was, it is estimated that total use was reduced at least 30 percent $[(10032 + 40716) - (30651 + 3686) \div 50748]$ between 1955 and 1977.

While no summaries were available regarding Forest Service permittees, the small amount of information available indicates the following:

1. Most sheep allotments are grazed by one permittee--one owner grazed his animals on four allotments during 1977.
2. Most cattle allotments are used by cattle which are owned by many permittees. For example, during 1977 there were 60 FS permits to graze 2,558 cattle and horses, which were permitted to remove 6,906 animal months of forage. The large number of permits and the relatively small number of animals indicates that most cattle permits are small--the average permit was for 42 animals and 115 animal months during 1977.

The same general trends are also true for BLM use. For example, the data in Table 17 indicate that relatively few BLM permits were for more than 500 AUMs--most permits were for less than 150 AUMs. Further-

counties contain Federal land. For example, Bear Lake County is generally administered by the FS, while Rich County has a relatively large acreage which is administered by the BLM. Furthermore, during 1975 BLM lands in Rich County were "blocked off" into single and common use allotments--twenty-six percent of Rich County was administered by the BLM, while approximately 12 percent was administered by the FS. The major difference between these two counties is reflected in the use of Federal lands over time (Tables 15 and 16). These data indicate that relatively large reductions occurred on FS and BLM lands used by Rich County operators in the early 60's. While these data do not indicate what the total change was, it is estimated that total use was reduced at least 30 percent $[(100\% - 40\%) - (30\% + 30\%) + 50\%] = 50\%$ between 1955 and 1975. While no summaries were available regarding Forest Service permits,

the small amount of information available indicates the following:

1. Most sheep allotments are given by one permittee--one owner grazes his animals on four allotments during 1975.
2. Most cattle allotments are used by cattle which are owned by many permittees. For example, during 1975 there were 60 FS permits to graze 2,500 cattle and horses, which were permitted to remove 6,900 animal months of forage. The large number of permits and the relatively small number of animals indicates that most cattle permits are small--the average permit was for 43 animals and 115 animal months during 1975.

The same general trends are also true for BLM use. For example, the data in Table 17 indicate that relatively few BLM permits were for more than 500 AUMs--most permits were for less than 150 AUMs. Further-

Table 15. Use of Forest Service lands by permittees from Rich County, 1955-1977.

	1977	1970	1965	1961	1959	1955
Cattle & Horses						
AMs permitted	2,558	2,502	1,929	5,918	9,388	
AMs actual	2,332	2,749	1,985		7,505	8,519
Sheep & Goats						
AMs permitted	7,177	10,028				
AMs actual	6,769	8,051	14,436		4,395*	7,564*
Total AUMs use						
Permitted	3,993	4,507				
Actual	3,686	4,359	4,872		8,384	10,032

* Data was only available for five sheep allotments. This would have represented approximately one-half the use made by all sheep.

Table 12. Use of Forest Service lands by permittees from Rich County, 1952-1977.

	1977	1970	1962	1961	1952	1952
Castle & Hornet						
Permitted	1,525	2,302	1,929	2,918	9,320	
Actual	2,302	2,302	1,929		7,502	2,210
Sheep & Goats						
Permitted	1,777	10,018			4,302	1,284
Actual	6,769	8,021	10,436			
Forest with use						
Permitted	2,603	4,501				
Actual	3,608	4,359	4,872		8,386	10,002

*Data was only available for five sheep allotments. This would have represented approximately one-half the use made by all sheep.

Table 17. Size (AUMs) of BLM permits used
by Rich County permittees, Salt
Lake District, 1970, 1971, and
1972.

Table 16. Use of BLM lands in Rich County.

Allotment or Area	AUMs of Use			
	Prior to 1958	After 1963	1971	1977
Randolph	14,417	8,841	9,144	9,834
Rich	9,190	4,603	4,811	4,550
Laketown/Round Valley	1,474	296	799	799
Woodruff	7,432	4,496	4,283	5,690
Uintah	8,146	3,537	3,537	3,537
Remaining allotments		7,980	5,218	6,214
TOTAL	40,716	29,753	27,792	30,651

Table 10. Use of BLM Lands in Rich County.

Adjustment or Area	Kind of Use		
	Prior to 1958	After 1957	1971
Timberland	14,617	8,361	9,744
Rich	9,190	4,603	4,711
Lawrenceburg Valley	1,476	290	299
Woodbury	7,432	4,456	4,261
Utah	8,146	3,237	3,237
Remaining adjustments		7,980	2,516
TOTAL	40,716	29,723	27,765
			30,681

Table 17. Size (AUMs) of BLM permits used by Rich County permittees, Salt Lake District, 1976, 1971, and 1967.

Size of Permits (AUMs)	Number of Permits		
	1967	1971	1976
Less than 50	13	20	17
51-100	12	22	17
101-200	21	28	30
201-300	16	29	21
301-500	26	16	10
501-750	5	4	3
More than 750	10	3	6

Table 18. Size of permits, Wasatch Resource area, BLM, 1978.

Permit Size	No. of Operators	No. of AUMs	AUMs per Operator
1-100	73	3,761	51
101-500	91	23,655	259
501-1,000	18	13,940	774
1,001-2,000	11	15,993	1,453
2,001-3,000	2	4,930	2,465
3,001-4,000	6	20,903	3,483
4,000+	5	48,666	9,733

more, these data also indicate a general downward trend--i.e., the average size of permits tended to decrease during the 1967-76 period. While these data indicate that most Rich County permits are relatively small, similar data for the Wasatch resource area, part of the Salt Lake district (BLM), which includes Rich County, indicates (Table 18) that Rich County permits make up a large portion of the small permits in this resource area. These data indicate that most permits in Rich County are relatively small.

While no data was available concerning the tenure of Rich County permits, data for the Wasatch resource area show that more than 70 percent of the permits had been held for more than 15 years (145 out of 206), and that less than 10% (16) had been held fewer than five years. This suggests that most permittees, including those in Rich County, have held their permits for a relatively long time. This is also borne out through adjudication records for this area--i.e., many of the same operators held permits before and after the reductions in Rich County were imposed. This suggests that the reductions in Rich County probably forced few operators out of business, but other adjustments probably occurred.

The data concerning private land use in Rich and Summit^{8/} Counties in Utah, Bear Lake and Caribou counties in Idaho, and state totals for Utah suggest that the following adjustments probably occurred in Rich County:

1. The percentage of full-time operators decreased in Rich County, when compared to Summit County and the state. The decrease, however, was similar to the decrease in Bear Lake County. This

^{8/} Summit County lies directly south of Rich County.

were, these data also indicate a general downward trend--i.e., the over-
all size of permits tended to decrease during the 1957-75 period. While
these data indicate that most of the permits were relatively small,
similar data for the Western resource area, part of the Salt Lake District
(SLD), which includes Rich County, indicates (Table 1) that Rich County
permits make up a large portion of the small permits in this resource
area. These data indicate that most permits in Rich County are relatively
small.

While no data was available concerning the trend of Rich County per-
mits, data for the Western resource area show that more than 70 percent
of the permits had been held for more than 15 years (145 out of 205), and
that less than 10% (10) had been held fewer than five years. This suggests
that most permittees, including those in Rich County, have held their per-
mits for a relatively long time. This is also borne out through adjust-
ment records for this area--i.e., many of the same operators held per-
mits before and after the reductions in Rich County were imposed. This
suggests that the reductions in Rich County probably forced few operators
out of business, but other adjustments probably occurred.

The data concerning private land use in Rich and Summit⁸ Counties
in 1960, 1965 and 1970 are similar to those for Idaho, and state totals for
Rich suggest that the following adjustments probably occurred in Rich
County:

1. The percentage of full-time operators decreased in Rich County,
which compares to Summit County and the state. The decrease,
however, was similar to the decrease in Bear Lake County. This

⁸Summit County does directly border Rich County.

suggests that reductions in federal land use may have had a tendency to force permittees to seek off-farm employment.

2. The average number of sheep per farm declined in Rich County from 1945 to 1965, while all other areas tended to either remain constant or increase. Other factors may have caused this trend, but the reductions in Rich County may have hurt large sheep operators.
3. Two anomalies appear in the data for Rich County. First, in 1964 the cropland used for pasture declined sharply. Second, while the tons of hay produced in all other counties in this area tended to increase, the tonnage produced in Rich County declined in 1954, as did state production. No explanation can be given for these differences, unless the data was incorrectly recorded or other unknown factors were responsible.
4. While the acreage of wild hay in most other areas has fluctuated over time, with a general tendency to remain constant, the acreage in Rich County has steadily declined, as did the tonnage produced. In general, however, these declines were offset by increases in alfalfa hay production. In fact, the increased tonnage of all hay produced, if converted at a ratio of 3 AUMs per ton, would be approximately equal to the decreased use of federal lands in Rich County.

While some other minor differences exist, most other adjustments were similar to changes in other areas where reductions in the use of federal lands have been small.

suggests that reductions in federal land use may have had a tendency to force permittees to seek off-farm employment.

3. The average number of sheep per acre declined in Rich County from 1945 to 1965, while all other areas tended to either remain constant or increase. Other factors may have caused this trend, but the reduction in Rich County may have been large enough to explain the trend.

4. The acreage of wild hay in Rich County, first, in 1965 the acreage used for pasture declined sharply. Second, while the cost of hay produced in all other counties in this area tended to increase, the forage produced in Rich County declined in 1964, as did state production. No explanation can be given for these differences, unless the data was incorrectly recorded or other unknown factors were responsible. While the acreage of wild hay in most other areas has fluctuated over time, with a general tendency to remain constant, the acreage in Rich County has steadily declined, as did the forage produced. In general, however, these declines were offset by increases in alfalfa hay production. In fact, the increased forage of all hay produced, if converted at a ratio of 3 tons per ton, would be approximately equal to the decreased use of federal lands in Rich County.

While some other minor differences exist, most other adjustments were similar to changes in other areas where reductions in the use of federal lands have been made.

Table 19. Agricultural statistics for Utah, 1950-1974.

	1950	1954	1959	1964	1969	1974
Number of farms	24,176	22,826	17,811	15,759	13,045	12,184
Average size of farms	449	537	712	817	867	871
Proportion of land in farms	20.6	23.3	24.1	24.4	21.5	20.2
Irrigated land in farms (acres)x 1,000	1,138	1,073	1,062	1,092	1,025	970
Cropland harvested (acres)x 1,000	1,279	1,229	1,062	1,039	1,024	1,089
Cropland used for pasture (acres)x 1,000	305	275	409	442	507	438
Other pasture (acres)x 1,000	6,815	8,733				

Number of full-time operators	16,854	15,703	11,398	9,956	8,229	7,942
Full-time as % of all operators	70	69	64	63	63	65

No. cattle and calves x 1,000	562	728	698	748	736	840
No. cows and heifers per farm	15	19	24	31	42	51
No. sheep and lambs: x 1,000	1,101	1,397	1,291	1,105	1,014	759
per farm	282	244	259	323	369	325

Crops:						
Wheat acres x 1,000	416	343	226	203	220	264
Barley acres x 1,000	128	145	144	118	116	114
Oats acres x 1,000	40	29	19	19	15	10
All hay: acres x 1,000	525	552	531	563	518	551
tons x 1,000	1,122	1,177	1,239	1,401	1,486	1,537
Alfalfa hay acres x 1,000	360	410	411	429	358	378
Wild hay acres x 1,000	100	84	64	66	56	61

Value of all products sold (x 100,000)	130	127	156	159	212	339
Livestock as % of total	40	41	50	79	82	72

Source: Census of Agriculture.

Table 15. Agricultural statistics for Utah, 1920-1974.

	1920	1924	1929	1934	1939	1974
Number of farms	24,778	22,826	17,871	12,728	13,042	15,184
Average size of farm	448	437	712	817	867	871
Production of land in farms	20.6	23.3	24.1	24.4	21.2	20.2
Irrigated land in farms (acres) x 1,000	1,128	1,073	1,082	1,092	1,058	920
Crop and pasture harvested (acres) x 1,000	7,279	7,258	7,062	7,039	7,004	7,089
Crop and pasture for pasture (acres) x 1,000	308	278	408	442	207	428
Other pasture (acres) x 1,000	6,872	6,732				
Number of full-time operators	10,824	12,703	11,286	8,426	8,229	7,042
Full-time as % of operators	70	69	64	63	63	69
Value of milk and calves x 1,000	262	258	408	740	728	840
Wool, corn and alfalfa per farm	12	12	24	31	42	21
Wool, sheep and goats x 1,000	1,701	1,347	1,281	1,108	1,014	728
Per farm	282	244	284	272	269	252
Crops:						
Wheat acres x 1,000	416	343	258	207	260	264
Barley acres x 1,000	128	142	144	118	116	114
Oats acres x 1,000	40	29	19	19	12	10
Alfalfa hay acres x 1,000	252	282	237	267	270	281
Wheat hay acres x 1,000	7,152	7,177	7,239	7,407	7,402	7,232
Alfalfa hay acres x 1,000	360	410	417	423	398	378
Wheat hay acres x 1,000	100	64	66	66	26	61
Value of all products sold (x 100,000)	130	127	128	188	212	238
Livestock as % of total	40	41	20	12	82	72

Source: Census of Agriculture.

Table 20. Agricultural statistics for Rich County, Utah, 1950-1974.

	1950	1954	1959	1964	1969	1974
Number of farms	243	275	227	204	168	168
Average size of farms	2,335	2,055	2,635	2,915	3,656	3,248
Proportion of land in farms	86.7	86.4	91.5	90.8	93.8	83.2
Irrigated land in farms (acres)	59,178	50,756	53,433	55,556	47,168	47,728
Cropland harvested (acres)	52,782	52,505	48,419	47,779	47,388	50,001
Cropland used for pasture (acres)	3,323	4,140	19,583	6,605	13,558	8,468
Other pasture (acres) x 1,000	498	397	447	533		

Number of full-time operators	170	223	138	128	93	112
Full-time as % of all operators	70	81	61	63	55	67

No. cattle and calves	27,752	29,551	29,459	33,295	33,060	40,922
No. cows and heifers per farm	61	61	81	109	136	178
No. sheep and lambs:	66,378	59,587	54,336	20,304	19,798	32,522
per farm	670	497	477	267	157	638

Crops:						
Wheat acres	3,511	3,319	3,085	2,111	5,042	4,347
Barley acres	2,423	2,776	3,054	2,789	2,063	2,377
Oats acres	545	302	504	308	99	293
All hay: acres	45,854	44,471	41,673	42,405	39,555	43,257
tens	48,502	39,010	49,532	53,776	54,182	65,772
Alfalfa hay acres	6,472	5,991	6,925	6,642	7,860	9,795
Wild hay acres	37,012	35,727	25,329	25,874	22,262	

Value of all products sold (x 1,000)	2,379	2,490	2,569	2,480	3,925	5,822
Livestock as % of total	83	88	92	90	93	86

Source: Census of Agriculture.

Table 20. Agricultural statistics for Rich County, Utah, 1950-1974

	1950	1954	1959	1964	1969	1974
Number of farms	241	225	227	204	168	168
Average size of farms	2,336	2,062	2,435	2,919	3,826	3,368
Proportion of land in farms	88.7	86.4	87.2	86.8	83.8	83.2
Irrigated land in farms (acres)	88,718	80,756	83,433	86,268	47,160	47,720
Cropland harvested (acres)	82,702	82,202	80,413	47,779	47,208	60,001
Cropland used for pasture (acres)	2,323	4,143	19,883	6,608	13,828	8,406
Other pasture (acres) x 1,000	488	397	447	633		
Number of full-time operators	170	223	178	158	83	115
Full-time or 2 of all operators	70	81	61	63	22	63
No. cattle and calves	27,763	28,261	29,488	33,248	33,080	40,812
No. cows and heifers per farm	61	61	81	100	176	178
No. sheep and lambs	68,378	58,867	54,338	50,304	19,788	32,823
per farm	670	465	473	267	187	636
Crops						
Wheat acres	2,261	3,319	3,087	2,117	2,042	4,307
Barley acres	2,453	2,776	3,054	2,788	2,053	2,377
Oats acres	246	202	204	308	99	291
Alf hay acres	42,884	44,471	41,673	42,408	39,282	43,227
Timothy	48,802	39,010	49,822	53,778	64,182	69,772
Mixture hay acres	6,472	6,981	6,952	6,645	7,860	9,792
Other hay acres	37,012	22,727	22,329	22,074	22,262	
Value of all products sold (x 1,000)	2,379	2,430	2,288	2,480	3,922	2,022
Livestock as % of total	83	88	92	90	93	86

Source: Census of Agriculture.

Table 21. Agricultural statistics for Summitt County, Utah, 1950-1974.

	1950	1954	1959	1964	1969	1974
Number of farms	480	443	363	360	344	304
Average size of farms	737	713	1,022	1,149	1,278	1,125
Proportion of land in farms	29.7	26.5	31.2	36.9	37.2	28.9
Irrigated land in farms (acres)	34,456	34,059	29,433	31,209	25,780	20,307
Cropland harvested (acres)	27,415	25,863	23,263	23,932	22,275	18,511
Cropland used for pasture (acres)	13,077	5,852	8,160	13,065	14,155	11,122
Other pasture (acres) x 1,000	191	258	318			

Number of full-time operators	337	320	244	267	235	206
Full-time as % of all operators	70.2	72.2	67.2	74.2	68.3	67.8

No. cattle and calves	14,070	15,850	13,758	15,700	19,137	19,851
No. cows and heifers per farm	17	21	24	30	40	50
No. sheep and lambs:	49,826	39,087	53,066	64,026	69,532	56,216
per farm	302	221	336	504	605	541

Crops:						
Wheat acres	1,724	1,114	902	520	564	506
Barley acres	2,108	2,158	1,718		1,387	790
Oats acres	1,125	883	697		414	157
All hay: acres	21,950	21,273	19,696	18,603	17,940	15,608
tons	37,089	34,998	39,710	42,158	46,985	46,985
Alfalfa hay acres	7,541	8,189	10,581	8,932	9,816	7,937
Wild hay acres	5,423	1,541	2,018			

Value of all products sold (x 1,000)	3,018	2,665	3,288	4,316	6,055	7,046
Livestock as % of total	46	44	47	95	96	91

Source: Census of Agriculture.

Table 27. Agricultural statistics for Summit County, Utah, 1920-1934

	1920	1924	1928	1932	1934	1935	1936
Number of farms	480	443	383	360	344	344	304
Average size of farms	737	773	1,032	1,149	1,378	1,378	1,125
Proportion of land in farms	52.7	56.8	31.5	36.8	37.5	38.8	38.8
Irrigated land in farms (acres)	34,488	34,022	29,433	31,509	28,700	28,700	28,700
Crop and pasture (acres)	27,478	28,063	23,263	23,935	23,578	23,578	23,578
Crop and used for pasture (acres)	12,075	8,025	8,160	13,082	14,126	14,126	14,126
Other pasture (acres) x 1,000	197	228	318				
Number of full-time operators	337	320	244	261	232	232	208
Full-time as % of all operators	70.2	72.5	63.5	74.5	68.3	68.3	67.8
Number of cows and calves	14,070	12,880	13,788	15,700	19,737	19,737	19,737
Number of cows and calves per farm	17	27	34	30	40	40	40
Number of sheep and goats	48,628	39,087	23,086	24,026	23,578	23,578	23,578
Number of sheep and goats per farm	305	251	336	294	294	294	294
Wheat acres	1,154	1,174	905	250	264	264	208
Barley acres	5,108	5,128	1,178		1,387	1,387	730
Oats acres	1,122	883	687		474	474	125
All hay acres	24,920	21,573	10,686	16,602	17,040	17,040	12,408
Long	37,089	34,928	20,710	45,720	46,982	46,982	46,982
Alfalfa hay acres	7,261	8,189	10,687	8,925	9,876	9,876	7,937
Other hay acres	6,453	1,247	2,078				
Value of all products sold (x 1,000)	2,078	2,462	2,528	4,376	6,022	6,022	7,046
Livestock as % of total	46	44	47	42	36	36	31

Source: Bureau of Agriculture.

Utah County, Utah

Unlike the other areas studied, Utah County is relatively urban. Its population has grown rapidly since 1950--population growth in Utah County is one of the fastest in the state, as well as in the West. It is also the second most populous county of the state (Utah Agricultural Statistics, 1976).

While Utah County is often viewed as an urban county, most of the land within its border is used for agricultural purposes. For example, the data in Figure 14 indicates that in 1967 more than 36 percent of the land, exclusive of federal, urban, and small water areas, in Utah County was not used as either cropland, pasture, or range. Furthermore, much of the federal land has historically been used by domestic livestock.

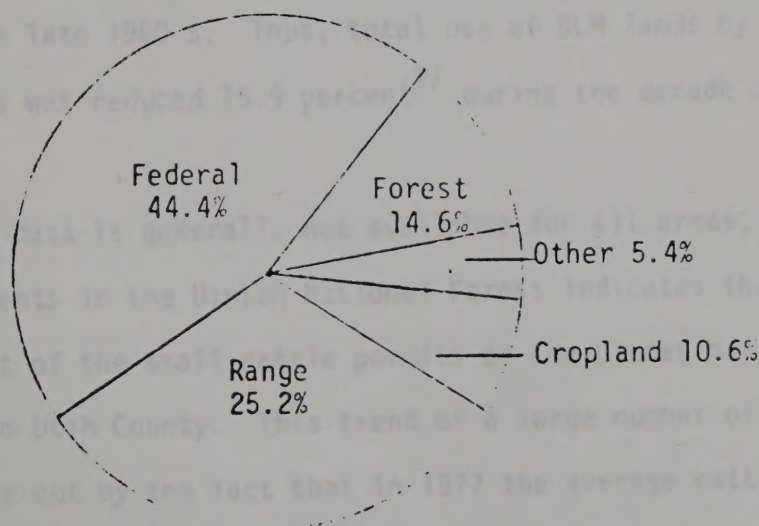


Figure 14. Use of land in Utah County, excluding federal, urban, and small water, percent of total land. Source: Utah Agricultural Statistics, 1976.

Like most areas in the west, federal lands in Utah are administered by the Forest Service (81.4%) and the BLM (16%). However, unlike many areas in the west, much of the Forest Service land in Utah County receives heavy use by recreationists. As a result, some areas that were once grazed

While the most recent studies, Utah County is relatively urban. Its population has grown rapidly since 1950—population growth in Utah County is one of the fastest in the state, as well as in the West. It is also the second most populous county of the state (Utah Agricultural Statistics, 1978).

While Utah County is often viewed as an urban county, most of the land within its border is used for agricultural purposes. For example, the data in Figure 14 indicates that in 1978 more than 50 percent of the land, exclusive of federal, urban, and small water areas, in Utah County was not used as either cropland, pasture, or range. Furthermore, much of the federal land has historically been used by domestic livestock.

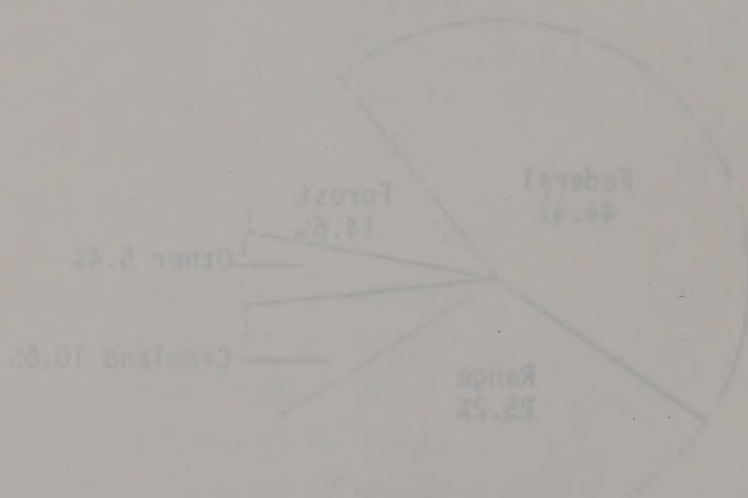


Figure 14. Use of land in Utah County, excluding federal, urban, and small water, percent of total land. Source: Utah Agricultural Statistics, 1978.

The most areas in the west, federal lands in Utah are administered by the Forest Service (81.4%) and the BLM (18%). However, unlike many areas in the west, much of the Forest Service land in Utah County receives heavy use by recreationalists. As a result, some areas that were once grazed

by domestic livestock have been reserved for recreation, while other areas have received large reductions in use for other reasons. These reductions are shown in Table 22. These data indicate that use of Forest Service lands was reduced more than sixty percent between 1951 and 1970. While actual use data for the Uintah National Forest are not available after 1972, permitted use has increased slightly, but these permitted levels of use are only slightly larger than the amount permitted in 1970. Thus, use today is much less than it was in 1951.

Permittees from Utah County also received reductions in the use of lands administered by the BLM. Use was reduced from 17,564 to 15,130 AUMs in the early 1960's on BLM lands administered in the Salt Lake district, and from 20,702 to 17,042 AUMs on lands administered by the Richfield district in the late 1960's. Thus, total use of BLM lands by Utah County operators was reduced 15.9 percent^{9/} during the decade of the 1960's.

While permittee data is generally not available for all areas, the data for the allotments in the Uintah National Forest indicates that 84(103 ÷ 123) percent of the small cattle permits on the Uintah National Forest lands are from Utah County. This trend of a large number of small permits is also borne out by the fact that in 1977 the average cattle permit allowed 34 animals to obtain 117 AUMs of forage from Uintah National Forest lands. Thus, most Forest Service permits owned by Utah County ranchers are small. Furthermore, these ranchers use the seven allotments involved in common.^{10/}

^{9/} $[(17,564 + 20,720) - (15,130 + 17,042)] \div 38,266.$

^{10/} Only one allotment had fewer than 5 permits, while one allotment was grazed by cattle which were owned by more than 70 ranchers.

by domestic livestock have been reserved for recreation, while other areas have received large reductions in use for other reasons. These reductions are shown in Table 2. These data indicate that use of forest Service lands was reduced more than sixty percent between 1921 and 1970. While actual use data for the Utah National Forest are not available after 1971, permitted use has increased slightly, but these permitted levels of use are only slightly larger than the amount permitted in 1921. Thus, use today is much less than it was in 1921.

Permitted use from Utah County also received reductions in the use of lands administered by the BLM. Use was reduced from 11,564 to 15,130 acres in the early 1960's on BLM lands administered in the Salt Lake District, and from 20,702 to 17,042 acres on lands administered by the Richfield District in the late 1960's. Thus, total use of BLM lands by Utah County ranchers was reduced 15.6 percent⁹ during the decade of the 1960's.

While permitted data is generally not available for all areas, the data for the allotments in the Utah National Forest indicates that 84(103 ; 123) percent of the small cattle permits on the Utah National Forest lands are from Utah County. This trend of a large number of small permits is also borne out by the fact that in 1977 the average cattle permit allowed 34 animals to graze 175 acres of forage from Utah National Forest lands. Thus, most forest Service permits owned by Utah County ranchers are small. Furthermore, these ranchers use the seven allotments involved in common.¹⁰

$$9) [(11,564 + 20,702) - (15,130 + 17,042)] = 38,566$$

¹⁰ Only one allotment had fewer than 2 permits, while one allotment was grazed by cattle which were owned by more than 70 ranchers.

Table 22. Actual use (AUMs) of Forest Service lands by permittees from Utah County, 1951-1970.

	1951 *	1955 *	1960	1965	1970
Uintah National Forest					
Sheep (AMs)	3,623	4,490	5,716	6,385	6,764
Cattle (AMs)	52,105	47,560	42,684	16,756	16,113
Manti-La Sal					
Sheep (AMs)	490	195	167	288	0
Cattle (AMs)	1,757	1,976	1,974	216	0
TOTAL (AUMs)	57,975	54,221	50,541	23,645	22,877

* Data for 1951 and 1955 from Uintah National Forest were not available for some allotments. The amounts shown are, therefore, underestimate total use.

Table 23. Number of permittees by size class of animals permitted to graze Uintah National Forest lands, 1977.

CATTLE			SHEEP		
No. of Animals	No. of Operators		No. of Animals	No. of Operators	
	Utah County	Forest Total		Utah County	Forest Total
1-25	103	123	1-500	1	3
26-50	24	43	501-1,000	3	3
51-100	20	36	1,001-2,000	4	11
101-200	7	16	2,001-3,500	1	9
201+	2	4	3,501+	2	7

Table 25. Actual use (AUMs) of Forest Service lands by permittees from Utah County, 1951-1970.

	1951*	1952*	1960	1962	1970
Utah National Forest					
Cattle (AUM)	25,105	47,560	45,681	16,786	76,113
Sheep (AUM)	3,623	4,490	5,716	6,782	6,761
Wildlife					
Cattle (AUM)	1,357	1,936	1,954	516	0
Sheep (AUM)	690	152	167	588	0
TOTAL (AUM)	31,975	54,521	53,511	23,612	82,874

*Data for 1951 and 1952 from Utah National Forest were not available for some allotments. The amounts shown are, therefore, underestimates of actual use.

Table 26. Number of permittees by class of animals permitted to graze Utah National Forest lands, 1971.

No. of Animals	No. of Operators	CATTLE		SHEEP	
		Utah County Forest Total	No. of Operators	Utah County Forest Total	No. of Operators
1-25	103	153		1-500	1
26-50	24	43		501-1,000	2
51-100	30	36		1,001-2,000	4
101-200	7	16		2,001-3,500	1
201+	5	4		3,501+	2

This general trend of a large number of relatively small permits also exists on BLM lands. However, many of the BLM allotments are small, and are used by livestock which are owned by one permittee. While data was not readily available for permittees from Utah County, permittee information from the Richfield district indicates that nearly 80 percent of the permittees using the House resource area (primarily Juab and northern Millard Counties) are permitted to graze less than 100 head of cattle (most Utah County permittees graze their animals in this resource area). These data indicate that permittees from this area are generally small operators.

One of the major complications in Utah County and the possible effect of reductions in the use of federal lands concerns dairying in the county. Unlike the other areas studied, dairy production represents a major portion of the animal production in the county. For example, in 1974 more than one-fourth of the cows and heifers were milk cows and the sale of dairy products was nearly as great as was the sale of cattle and calves. Furthermore, census data did not separate beef from dairy cattle before 1974, so the numbers indicated in Table 24 reflect both dairy and beef cattle numbers over time. Therefore, the reader should recognize that the cattle industry data which follows includes dairy, as well as beef numbers.

While the diversification^{11/} of agricultural production in Utah County limits any inferences that can be made regarding the impact of reductions in federal grazing, the following general trends are suggested:

^{11/} Dairy and poultry production are more important in Utah County than they are in any other county included in this study.

This general trend of a large number of relatively small permits also exists on BLM lands. However, many of the BLM allotments are small, and are used by livestock which are owned by one permittee. While data was not readily available for permittees from Utah County, permittees from the Richfield district indicates that nearly 80 percent of the permittees using the House resource area (primarily sheep and northern milled counties) are permitted to graze less than 100 head of cattle (most Utah County permittees graze their animals in this resource area). These data indicate that permittees from this area are generally small operators.

One of the major considerations in Utah County and the possible effect of reductions in the use of federal lands concern dairying in the county. While the other areas studied, dairy production represents a major portion of the animal production in the county. For example, in 1978 more than one-fourth of the cows and heifers were milk cows and the sale of dairy products was nearly as great as was the sale of cattle and calves. Furthermore, census data did not separate beef from dairy cattle before 1974, so the numbers indicated in Table 24 reflect both dairy and beef cattle numbers over time. Therefore, the reader should recognize that the cattle industry data which follows includes dairy, as well as beef numbers.

While the diversification¹¹ of agricultural production in Utah County limits any inferences that can be made regarding the impact of reductions in federal grazing, the following general trends are suggested:

¹¹ Dairy and poultry production are more important in Utah County than they are in any other county included in this study.

Table 24. Agricultural statistics for Utah County, Utah, 1950-1974.

	1950	1954	1959	1964	1969	1974
Number of farms	3,191	3,179	2,358	2,312	1,733	1,605
Average size of farms	179	168	292	301	326	301
Proportion of land in farms	44.7	41.7	53.8	53.9	43.9	37.5
Irrigated land in farms (acres)	97,683	86,549	92,277	99,236	78,974	81,854
Cropland harvested (acres)x 1,000	571	533	687	696	565	483
Cropland used for pasture (acres)	14,001	28,124	28,692	23,679	31,309	31,640
Other pasture (acres)x 1,000	360	286	508	512		

Number of full-time operators	2,345	2,399	1,601	1,595	1,139	1,083
Full-time as % of all operators	73	75	68	70	66	68

No. cattle and calves	42,117	53,064	60,951	64,334	58,937	60,583
No. cows and heifers per farm	9	11	16	19	26	30
No. sheep and lambs: x 1,000	85	115	113	101	84	72
per farm	257	215	253	298	342	310

Crops:						
Wheat acres	24,263	10,296	14,235	13,112	14,095	18,181
Barley acres	17,487	14,545	15,286	14,079	12,375	12,243
Oats acres	2,668	2,287	1,911	1,870	1,207	787
All hay: acres	35,640	38,837	38,116	42,227	31,606	32,500
tons x 1,000	95	103	113	123	111	110
Alfalfa hay acres	26,095	29,059	27,893	31,326	20,904	24,129
Wild hay acres	7,933	7,538	6,565	6,233		4,424

Value of all products sold (x 100,000)	13	14	17	18	26	38
Livestock as % of total	30	27	43	41	73	68

Source: Census of Agriculture.

Table 24. Agricultural Statistics for Utah County, Utah, 1920-1934

	1920	1924	1928	1932	1934
Number of farms	2,781	2,159	2,388	2,375	1,602
Average size of farm	170	168	202	201	201
Proportion of land in farms	41.7	41.7	43.8	43.9	43.8
Irrigated land in farms (acres)	97,863	88,249	92,571	90,736	87,824
Crop land harvested (acres) x 1,000	871	833	867	868	483
Crop land used for pasture (acres)	14,001	20,154	28,645	27,678	21,640
Other pasture (acres) x 1,000	360	586	808	815	
Number of full-time operators	2,242	2,399	1,601	1,592	1,093
Full-time as % of all operators	73	72	68	70	68
No. cattle and calves	42,171	52,084	60,921	64,124	58,937
No. cows and heifers per farm	9	11	16	18	20
No. sheep and lambs x 1,000	82	112	113	101	75
per farm	297	512	481	428	410
Crops:					
Wheat acres	54,583	10,526	14,522	13,112	18,191
Barley acres	15,487	14,242	12,286	14,029	12,243
Oats acres	5,588	4,587	1,911	1,870	1,801
All hay: acres	38,841	35,817	38,118	42,527	31,404
Alfalfa hay acres	26,022	29,069	27,883	31,356	20,904
Wild hay acres	12,819	6,748	10,235	11,171	10,499
Value of all products sold (x 100,000)	13	14	17	18	26
Livestock as % of total	30	27	43	41	62

Source: Census of Agriculture.

1. The relatively stable number of cattle and calves in Utah County, when compared to Juab County^{12/} or to the state, suggests that the growth of the cattle industry in Utah County may have been retarded as a result of the reductions in the use of federal lands. However, cattle numbers in Salt Lake County (Table 25) declined after 1959. This suggests that other factors may have also contributed to the reduced growth rate of the cattle industry in Utah County.
2. The relatively small increase in the number of cows and heifers per farm, when combined with the size distribution of Forest Service and BLM permits in Utah County, suggests that many of the small operators have probably remained in business. If this is true, it suggests that reductions in this area probably had little impact on these operators, as many (most?) would have other sources of income.
3. The data for Utah County also suggests that in the early 60's, when the largest reductions in the use of federal lands occurred, hay production increased (acreage and tonnage), the number of animals remained essentially constant, and the amount of cropland used for pasture decreased. Thus, in the short run Utah County permittees may have adjusted to reductions in federal forage by growing more hay.

In summary, the data for Utah County suggests the same general adjustments as occurred in Bear Lake and Rich Counties--i.e., reduced growth in cattle numbers and increased hay production.

^{12/} Juab County lies south of Utah County, while Salt Lake County borders Utah County to the north.

1. The relatively stable number of cattle and calves in Utah County when compared to Juab County¹² or to the state, suggests that the growth of the cattle industry in Utah County may have been retarded as a result of the reductions in the use of federal lands. However, cattle numbers in Salt Lake County (Table 25) declined after 1959. This suggests that other factors may have also contributed to the reduced growth rate of the cattle industry in Utah County.

2. The relatively small increase in the number of cows and heifers per farm, when combined with the size distribution of forest service and BLM permits in Utah County, suggests that many of the small operators have probably remained in business. If this is true, it suggests that reductions in this area probably had little impact on these operators, as many (most) would have other sources of income.

3. The data for Utah County also suggests that in the early 60's, when the largest reductions in the use of federal lands occurred, hay production increased (acres and tonnage), the number of animals remained essentially constant, and the amount of cropland used for pasture decreased. Thus, in the short run Utah County herds/less may have adjusted to reductions in federal forage by growing more hay.

In summary, the data for Utah County suggests the same general adjustments as observed in Bear Lake and Rich Counties--i.e., reduced growth in cattle numbers and increased hay production.

¹² Juab County lies south of Utah County, while Salt Lake County borders Utah County to the north.

Table 25. Agricultural statistics for Salt Lake County, Utah, 1950-1974.

	1950	1954	1959	1964	1969	1974
Number of farms	2,592	2,072	1,383	889	798	592
Average size of farms	175	264	445	452	328	378
Proportion of land in farms	101.1	111.9	125.8	82.1	53.6	45.8
Irrigated land in farms (acres)	49,499	49,531	47,760	33,876	33,970	27,662
Cropland harvested (acres)	57,961	59,474	54,757	45,370	39,447	36,075
Cropland used for pasture (acres)	10,085	5,731	8,093	38,055	9,840	7,508
Other pasture (acres) x 1,000	338	408	479			

Number of full-time operators	2,035	1,625	949	585	494	378
Full-time as % of all operators	79	78	69	66	62	64

No. cattle and calves	14,821	22,385	26,179	17,014	16,510	16,817
No. cows and heifers per farm	5	8	12	17	22	28
No. sheep and lambs:	53,062	84,262	59,536	60,175	19,874	34,981
per farm	231	204	183	365	147	289

Crops:						
Wheat acres	25,574	22,620	18,061	17,267	13,498	14,490
Barley acres	4,480	6,528	7,616		3,984	2,979
Oats acres	1,553	1,321	987		229	227
All hay: acres	16,898	18,347	17,959	12,829	13,864	13,008
tuns	53,373	56,075	60,720	43,933	48,531	48,821
Alfalfa hay acres	14,897	17,026	15,701	8,582	9,148	9,328
Wild hay acres	1,443	327	978			

Value of all products sold (x 1,000)	12,133	9,620	12,927	12,231	14,547	23,275
Livestock as % of total	20	22	29			34

Source: Census of Agriculture.

Table 2. Agricultural statistics for Salt Lake County, Utah, 1920-1974.

	1920	1924	1928	1932	1936	1940	1944
Number of farms	5,282	5,075	4,383	3,883	3,583	3,283	2,983
Average size of farms	175	204	445	455	455	455	455
Proportion of land in farms	107.1	111.2	122.8	125.1	125.1	125.1	125.1
Irrigated land in farms (acres)	49,489	49,531	47,350	33,876	33,876	33,876	33,876
Crop land harvested (acres)	51,901	52,474	54,757	55,310	55,310	55,310	55,310
Crop land used for pasture (acres)	10,082	2,731	8,093	30,082	2,840	2,840	2,840
Other pasture (acres) x 1,000	335	408	479				
Number of full-time operators	5,032	4,652	3,943	3,583	3,283	2,983	2,683
Full-time as % of all operators	79	79	63	66	66	66	66
Cattle and calves	14,831	25,385	30,179	17,014	16,510	16,510	16,510
Hogs and hogs per farm	2	8	13	13	13	13	13
Wool sheep and lambs	53,085	84,565	59,526	60,175	19,874	34,921	
Wool per farm	531	504	103	388	103	388	
Crops:							
Wheat acres	52,274	55,850	18,081	17,287	17,488	17,488	
Barley acres	4,480	6,558	7,616				
Oats acres	1,523	1,357	983				
All hay acres	16,888	16,347	17,929	15,659	13,064	13,064	
Alfalfa hay acres	82,913	26,075	60,720	47,911	48,231	48,231	
Wild hay acres	14,883	17,056	12,701	8,285	2,168	2,168	
Value of all products sold (1,000)	12,133	9,850	15,953	13,231	14,521	14,521	
Livestock as % of total	50	52	59				

Source: Census of Agriculture.

Table 26. Agricultural statistics for Juab County, Utah, 1950-1974.

	1950	1954	1959	1964	1969	1974
Number of farms	349	337	246	253	236	201
Average size of farms	548	690	974	1,036	865	780
Proportion of land in farms	8.7	10.6	11.0	11.9	9.4	7.2
Irrigated land in farms (acres)	17,077	9,637	11,757	14,521	14,307	14,129
Cropland harvested (acres)	38,956	32,318	21,608	23,770	24,882	25,724
Cropland used for pasture (acres)	5,462	13,242	9,097	10,870	19,039	16,306
Other pasture (acres) x 1,000	74	116	173	189		

Number of full-time operators	202	197	158	143	145	129
Full-time as % of all operators	58	58	64	57	61	64

No. cattle and calves	9,033	11,311	10,246	11,701	14,261	15,569
No. cows and heifers per farm	18	23	29	30	45	50
No. sheep and lambs:	9,477	17,886	17,075	18,307	14,293	6,749
per farm	130	143	201	273	340	307

Crops:						
Wheat acres	24,705	19,360	10,787	9,970	11,686	11,892
Barley acres	1,936	2,036	1,538	1,499	1,228	1,420
Oats acres	408	202	61	132	336	60
All hay: acres	7,586	9,634	8,137	10,611	10,167	10,378
tons	15,644	17,323	15,588	23,382	24,544	27,133
Alfalfa hay acres	6,350	7,420	6,060	7,893	6,057	7,065
Wild hay acres	470	1,490	1,683	1,346		1,005

Value of all products sold (x 1,000)	2,005	2,521	1,472	3,099	2,173	3,133
Livestock as % of total	30	26	66	34	79	43

Source: Census of Agriculture.

Livestock as % of total									
Value of all products sold (\$ 1,000)									
430	1,400	1,600	1,300	430	1,400	1,600	1,300	430	1,400
Wild hay acres									
Alfalfa hay acres									
Tons									
12,044	17,123	12,508	23,385	24,644	17,123	12,508	23,385	24,644	17,123
7,286	8,634	8,737	10,671	10,707	7,286	8,634	8,737	10,671	10,707
408	505	61	135	328	408	505	61	135	328
1,236	2,030	1,523	1,400	1,528	1,236	2,030	1,523	1,400	1,528
24,702	19,360	10,787	8,970	11,685	24,702	19,360	10,787	8,970	11,685
Crops:									
Wheat acres									
Barley acres									
Oats acres									
All hay: acres									
Per farm									
130	143	201	222	240	130	143	201	222	240
No. sheep and lambs:									
No. cows and heifers per farm									
No. cattle and calves									
8,033	11,311	10,246	11,701	14,261	8,033	11,311	10,246	11,701	14,261
Full-time as % of all operators									
28	28	64	27	61	28	28	64	27	61
Number of full-time operators									
205	197	128	143	152	205	197	128	143	152
Other pasture (acres) x 1,000									
74	116	173	189		74	116	173	189	
Crabland used for pasture (acres)									
2,465	13,245	9,087	10,870	19,031	2,465	13,245	9,087	10,870	19,031
Crabland harvested (acres)									
28,968	35,318	21,606	23,710	24,805	28,968	35,318	21,606	23,710	24,805
Irrigated land in farm (acres)									
17,077	8,637	11,787	14,257	14,307	17,077	8,637	11,787	14,257	14,307
Proportion of land in farm									
8.7	10.6	11.0	11.9	12.2	8.7	10.6	11.0	11.9	12.2
Average size of farm									
248	620	974	1,036	862	248	620	974	1,036	862
Number of farms									
343	337	246	223	201	343	337	246	223	201

Lincoln County, Nevada

Lincoln County is located near the southeastern tip of Nevada. It is an area that receives very little precipitation, and represents a rather harsh environment. As a result, nearly 84 percent of the land area is administered by the BLM, while less than one percent is administered by the Forest Service. These lands provide grazing for domestic livestock during every season of the year. Furthermore, this is the only area included in the study where water base permits^{13/} exist. As a result, livestock owned by several permittees from Lincoln County are allowed to graze federal and BLM lands essentially year round.

While data was not readily available for permittees just from Lincoln County, the data for the Caliente and Schell resource areas^{14/} indicates that permits in this area are larger than those in the other areas studied (Tables 27 and 28). Furthermore, the permits in this area are owned by a relatively small number of individuals. Data from the BLM also indicate that more than half of the permittees have held their permits for 15 or more years. Furthermore, nearly half the permits allow livestock to graze the Caliente resource area for 10 or more months. Thus, permittees in this area would be expected to depend heavily on federal lands for their livelihood.

Only two permittees from Lincoln County are permitted to graze Forest Service lands in Nevada. Records from the Humbolt National Forest indicate that the use of the allotment involved has been relatively constant--the

^{13/}Ownership of a "water base" is used as the foundation for awarding grazing privileges, rather than a "land base".

^{14/}The Caliente resource area is primarily in Lincoln County, and is part of the Las Vegas district. The Schell resource area is part of the Ely district, and includes a large portion of White Pine County.

Lincoln County is located near the southeastern tip of Nevada. It is an area that receives very little precipitation, and represents a rather harsh environment. As a result, nearly 84 percent of the land area is administered by the BLM, while less than one percent is administered by the Forest Service. These lands provide grazing for domestic livestock during every season of the year. Furthermore, this is the only area included in the study where water base permits¹³ exist. As a result, livestock owned by several permittees from Lincoln County are allowed to graze federal and BLM lands essentially year round.

While data was not readily available for permittees just from Lincoln County, the data for the California and Schell resource areas¹⁴ indicates that permits in this area are larger than those in the other areas studied (Tables 2 and 3). Furthermore, the permits in this area are owned by a relatively small number of individuals. Data from the BLM also indicate that more than half of the permittees have held their permits for 15 or more years. Furthermore, nearly half the permits allow livestock to graze the California resource area for 10 or more months. Thus, permittees in this area would be expected to depend heavily on federal lands for their livestock.

Only two permittees from Lincoln County are permitted to graze Forest Service lands in Nevada. Records from the Nevada National Forest indicate that the use of the allotment involved has been relatively constant--the

¹³Ownership of a "water base" is used as the foundation for awarding grazing privileges, rather than a "land base."

¹⁴The California resource area is primarily in Lincoln County, and is part of the Las Vegas district. The Schell resource area is part of the Elko district, and includes a large portion of White Pine County.

Table 27. Size distribution of permits in the Schell and Caliente Resource areas, Nevada, 1978.

Permit Size in AUMs	Schell Resource Area		Caliente Resource Area	
	No. of Operators	Ave. No. AUMs Per Operator	No. of Operators	Ave. No. AUMs Per Operator
1-100	1	66	5	70
101-500	19	344	17	340
501-1,000	5	684	21	720
1,001-2,000	5	1,462	13	1,330
2,001-3,000	5	2,462	2	2,615
3,001-4,000	7	3,662	4	3,486
4,001-5,000	1	4,349	1	2,126
5,001-15,000	10	8,339	6	3,036
15,001-25,000	2	18,379	1	16,169
25,000+	3	34,464		
TOTAL	58	4,883	93	200

Table 28. Distribution of herd size, Schell and Caliente Resource areas, Nevada, 1978.

No. of Cattle & Horses	Schell Resource Area		Caliente Resource Area	
	No. of Operators	Ave. Head Per Operator	No. of Operators	Ave. Head Per Operator
1-25	0	0	9	14
26-50	5	38	10	44
51-100	6	87	17	77
101-200	10	130	19	144
201-350	6	275	5	284
351-500	5	425	10	444
501-1,000	11	808	1	667
1,001-5,000	7	2,082	2	1,713
TOTAL	50		73	1,228

Table 28. Distribution of herd size, Schell and Caliente Resource Areas, Nevada, 1978.

Cattle & Horses	No. of Operators	Schell Resource Area		Caliente Resource Area	
		Ave. Head Per Operator	No. of Operators	Ave. Head Per Operator	No. of Operators
1-25	8	0	9	15	15
26-50	5	38	10	46	46
51-100	6	87	17	77	77
101-200	10	130	19	144	144
201-300	8	272	8	286	286
301-500	4	450	10	448	448
501-1,000	11	808	1	667	667
1,001-5,000	3	5,082	2	1,712	1,712
TOTAL	50		73	1,558	1,558

actual use totaled 767 AUMs in 1976, 795 in 1975, 1,027 in 1970, 854 in 1965, and 1,000 AUMs in 1960.^{15/} These changes are so small that their impact on the county is assumed to be nil.

Data from the Las Vegas and Ely districts indicate that major reductions in the use of BLM lands used by Lincoln County operators occurred during the 1968-69 period.^{16/} These data (Table 29) indicate that use was reduced from nearly 167 thousand AUMs to nearly 123 thousand. While no data are available concerning what level of actual use occurred over time, it was assumed that actual use was equal to the amount permitted. Scheduled use for 1978 (Table 29) suggests, however, that actual use of federal lands may have been less than the amounts permitted (licensed).

When private land use data (Tables 30 and 33) for Lincoln County are compared to White Pine County and state totals, several differences become evident:

1. The number of acres of hay nearly doubled in Lincoln County between 1969 and 1974, while White Pine County and state acreages increased at a slower rate. These increased acreages resulted in an increase in the number of tons of hay produced in Lincoln County. If this increased volume is converted at a rate of 3 AUMs per ton, the increased tonnage of hay would be equal to more than 52 thousand AUMs. This amount is greater than the decrease in federal land use. This increased hay production in Lincoln County occurred at the same time that hay production decreased in White Pine County, and in the state. Furthermore,

^{15/}Data were not available for these two permittees beyond 1960, but total use of the allotment was 1,140 AUMs in 1960, 713 in 1955, and 657 AUMs in 1950.

^{16/}Adjustments have occurred during other years, but nearly all of the reductions in use occurred in 1967, 1968, or 1969.

Table 29. Reduced Use of BLM lands by Lincoln County operators.

	AUMs of Use		
	Caliente Resource Area	Schell Resource Area	Total
Use before change (prior to 1965)	87,067	79,905	166,972
Active use (after 1970)	54,251	68,592	122,843
Scheduled use, 1978	39,793	31,775	71,568

Table 1. Reduced use of BLM land by Lincoln County operators.

Amount of use	Collected use, 1976		Active use (after 1975)	Use before 1976 (prior to 1975)
	Collected Resource Area	Set-Back Resource Area		
Total	20,735	21,795	175,863	155,717

Table 30. Selected agricultural statistics for Nevada, 1967-1977.

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Number of cattle & calves on farms x 1,000											
Clark County	13.1	13.4	14.0	13.5	13.8	14.0	13.5	15.0	13.0	15.0	16.0
Lincoln County	13.7	14.2	15.6	16.4	15.3	15.4	15.7	15.7	16.0	18.0	17.0
Nye County	27.8	29.5	29.1	29.8	33.1	32.0	31.0	32.0	32.0	30.0	28.0
White Pine County	24.3	22.6	23.6	24.5	21.9	23.9	23.0	26.0	22.0	26.0	22.0
<u>Total State</u>	562.0	568.0	608.0	626.0	639.0	645.0	651.0	664.0	657.0	651.0	600.0
Hay production (tons) x 1,000											
Clark County			23.9	28.6	24.3	21.5		32.5	33.3	34.0	
Lincoln County			16.0	15.2	13.8	13.5		27.9	29.4	27.3	
Nye County			32.5	25.3	22.0	30.6		29.6	25.9	23.8	
White Pine County			34.6	30.3	29.1	25.1		26.2	27.5	30.0	
<u>Total State</u>			950.0	899.0	982.0	870.0	891.0	913.0	885.0	939.0	
Alfalfa Hay (tons) x 1,000											
Clark County			23.0	27.7	23.6	20.9		31.9	32.4	33.0	
Lincoln County			14.0	13.5	11.8	11.4		26.0	27.0	24.7	
Nye County			23.0	15.1	12.6	24.0		24.8	19.9	17.2	
White Pine County			25.8	23.8	22.4	19.2		20.8	22.5	21.6	
<u>Total State</u>			605.0	571.0	598.0	578.0		621.0	598.0	603.0	

Source: Nevada Agricultural Statistics

1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896	2897	2898	2899	2900	2901	2902	2903	2904	2905	2906	2907	2908	2909	2910	2911	2912	2913	2914	2915	2916	2917	2918	2919	2920	2921	2922	2923	2924	2925	2926	2927	2928	2929	2930	2931	2932	2933	2934	2935	2936	2937	2938	2939	2940	2941	2942	2943	2944	2945	2946	2947	2948	2949	2950	2951	2952	2953	2954	2955	2956	2957	2958	2959	2960	2961	2962	2963	2964	2965	2966	2967	2968	2969	2970	2971	2972	2973	2974	2975	2976	2977	2978	2979	2980	2981	2982	2983	2984	2985	2986	2987	2988	2989	2990	2991	2992	2993	2994	2995	2996	2997	2998	2999	3000	3001	3002	3003	3004	3005	3006	3007	3008	3009	3010	3011	3012	3013	3014	3015	3016	3017	3018	3019	3020	3021	3022	3023	3024	3025	3026	3027	3028	3029	3030	3031	3032	3033	3034	3035	3036	3037	3038	3039	3040	3041	3042	3043	3044	3045	3046	3047	3048	3049	3050	3051	3052	3053	3054	3055	3056	3057	3058	3059	3060	3061	3062	3063	3064	3065	3066	3067	3068	3069	3070	3071	3072	3073	3074	3075	3076	3077	3078	3079	3080	3081	3082	3083	3084	3085	3086	3087	3088	3089	3090	3091	3092	3093	3094	3095	3096	3097	3098	3099	3100	3101	3102	3103	3104	3105	3106	3107	3108	3109	3110	3111	3112	3113	3114	3115	3116	3117	3118	3119	3120	3121	3122	3123	3124	3125	3126	3127	3128	3129	3130	3131	3132	3133	3134	3135	3136	3137	3138	3139	3140	3141	3142	3143	3144	3145	3146	3147	3148	3149	3150	3151	3152	3153	3154	3155	3156	3157	3158	3159	3160	3161	3162	3163	3164	3165	3166	3167	3168	3169	3170	3171	3172	3173	3174	3175	3176	3177	3178	3179	3180	3181	3182	3183	3184	3185	3186	3187	3188	3189	3190	3191	3192	3193	3194	3195	3196	3197	3198	3199	3200	3201	3202	3203	3204	3205	3206	3207	3208	3209	3210	3211	3212	3213	3214	3215	3216	3217	3218	3219	3220	3221	3222	3223	3224	3225	3226	3227	3228	3229	3230	3231	3232	3233	3234	3235	3236	3237	3238	3239	3240	3241	3242	3243	3244	3245	3246	3247	3248	3249	3250	3251	3252	3253	3254	3255	3256	3257	3258	3259	3260	3261	3262	3263	3264	3265	3266	3267	3268	3269	3270	3271	3272	3273	3274	3275	3276	3277	3278	3279	3280	3281	3282	3283	3284	3285	3286	3287	3288	3289	3290	3291	3292	3293	3294	3295	3296	3297	3298	3299	3300	3301	3302	3303	3304	3305	3306	3307	3308	3309	3310	3311	3312	3313	3314	3315	3316	3317	3318	3319	3320	3321	3322
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

Table 31. Agricultural statistics for Lincoln County, Nevada, 1950-1974.

	1950	1954	1959	1964	1969	1974
Number of farms	145	134	102	92	86	75
Average size of farms	385	2,413	457	530	451	778
Proportion of land in farms	0.8	4.7	0.7	0.7	0.6	.9
Irrigated land in farms (acres)	12,276	8,256	8,895	10,933	8,809	13,879
Cropland harvested (acres)	6,937	5,709	5,534	6,530	6,635	12,812
Cropland used for pasture (acres)	5,213	6,813	11,865	9,650	6,410	15,947
Other pasture (acres) x 1,000	25	307	16	28		

Number of full-time operators	115	109	79	69	69	51
Full-time as % of all operators	79	81	77	75	80	68

No. cattle and calves	13,200	17,833	14,476	12,069	16,032	20,506
No. cows and heifers per farm	63	82	70	82	120	151
No. sheep and lambs:	2,802	2,953	298	158	267	40
per farm	117	102	12	16	27	10

Crops:						
Wheat acres	101	3	4	100	100	93
Barley acres	685	251	183	55	40	40
Oats acres	81	422				
All hay: acres	5,465	5,033	5,031	5,806	6,349	12,364
tons	11,836	9,763	10,332	12,421	16,467	34,555
Alfalfa hay acres	1,856	1,890	2,045	2,402	4,303	10,585
Wild hay acres	2,865	2,603	2,120	2,907		

Value of all products sold (x 1,000)	749	636	1,018	947	1,586	2,096
Livestock as % of total	88	84	78	60	93	83

Source: Census of Agriculture.

Livestock as % of total

Value of all products sold (\$1,000)

	1950	1954	1959	1964	1969	1974
Value of all products sold (\$1,000)	749	836	1,018	847	1,288	2,006
Livestock as % of total	88	84	78	60	53	83
Wild hay acres	2,862	2,609	2,150	2,907		
Alfalfa hay acres	1,886	1,890	2,042	2,402	4,303	10,688
Other hay acres	17,836	9,363	10,332	15,451	16,467	34,662
All hay acres	2,468	2,033	2,032	2,806	6,769	15,364
Dairy acres	81	422				
Barley acres	688	521	163	22	40	40
Wheat acres	101	3	4	100	100	83

per farm

Wool sheep and hedges	112	102	15	16	52	10
Cows and heifers per farm	5,805	5,923	588	758	587	40
Cattle and calves	63	85	30	82	150	121
Full-time as % of all operators	72	81	77	72	80	68
Number of full-time operators	112	109	79	69	69	51

Other pasture (acres) x 1,000

Programs used for pasture (acres)

Overland harvested (acres)

Privatized land in farms (acres)

Proportion of land in farms

Average size of farms

Number of farms

52	307	16	26		
2,513	6,812	11,066	6,650	6,410	12,947
6,937	2,708	2,234	6,230	6,638	12,815
15,278	8,256	8,692	10,993	8,808	10,878
0.8	4.7	0.7	0.7	0.6	1.9
388	2,413	457	670	427	728
146	134	102	95	86	72

Table 32. Agricultural statistics for White Pine County, Nevada, 1950-1974.

	1950	1954	1959	1964	1969	1974
Number of farms	148	148	130	113	102	100
Average size of farms	1,186	1,754	2,732	2,479	1,774	2,312
Proportion of land in farms	3.1	4.6	6.2	4.9	3.2	4.1
Irrigated land in farms (acres)	41,921	22,283	21,789	35,543	26,484	24,366
Cropland harvested (acres)	21,970	17,610	14,284	19,547	13,923	14,963
Cropland used for pasture (acres)	15,233	6,760	13,513	13,489	9,128	6,908
Other pasture (acres) x 1,000	117	218	322	208		

Number of full-time operators	118	126	95	79	82	84
Full-time as % of all operators	80	85	73	70	80	84

No. cattle and calves	25,434	25,012	21,598	26,589	23,943	26,574
No. cows and heifers per farm	110	115	98	147	151	192
No. sheep and lambs:	54,034	77,132	76,686	50,631	39,142	41,690
per farm	1,001	1,307	1,145	1,125	1,058	1,345

Crops:						
Wheat acres	510	171	275	757	286	534
Barley acres	1,343	530	384	619	625	538
Oats acres	635	403	179	195	304	68
All hay: acres	18,935	16,243	13,113	17,327	12,283	13,163
tons	33,340	24,151	19,898	27,328	31,949	28,362
Alfalfa hay acres	7,968	8,196	6,688	7,581	7,829	8,598
Wild hay acres	8,632	7,598	2,991	4,543		

Value of all products sold (x 1,000)	2,274	1,810	2,317	2,137	2,543	3,399
Livestock as % of total	88	90	93	87	95	89

Source: Census of Agriculture.

Table 25. Agricultural Statistics for White Pine County, Nevada, 1950-1954

	1954	1953	1952	1951	1950
Number of farms	148	130	148	148	100
Average size of farm	1,106	1,734	1,732	1,734	1,734
Percentage of land in farms	3.1	4.6	4.2	4.2	4.1
Irrigated land in farms (acres)	61,921	52,283	51,788	52,843	52,308
Crop land harvested (acres)	51,920	47,010	46,784	47,843	47,843
Crop land used for pasture (acres)	12,231	6,780	13,813	13,489	6,408
Other pasture (acres) x 1,000	117	518	352	308	
Number of full-time operators	178	156	92	79	84
Part-time or 2 of all operators	80	62	73	70	84
Tractors and crawler	110	112	90	147	132
Tractors and trailers per farm	64,024	77,132	76,608	80,621	61,640
No. sheep and lambs	1,001	1,205	1,146	1,152	1,242
Per farm					
Crops:					
Wheat acres	810	171	272	252	254
Barley acres	1,343	630	384	612	238
Oats acres	632	413	138	182	68
Alfalfa hay acres	18,932	16,243	13,113	17,321	13,147
Other hay acres	33,340	24,121	19,888	27,328	21,949
Other crops	7,968	8,196	6,682	7,261	8,298
Value of all products sold (x 1,000)	5,274	1,810	2,317	2,191	2,389
Livestock as % of total	88	90	93	87	88

Source: Census of Agriculture.

Table 33. Agricultural statistics for Nevada, 1950-1974.

	1950	1954	1959	1964	1969	1974
Number of farms	3,110	2,857	2,354	2,156	2,112	2,076
Average size of farms	2,271	2,831	4,648	4,862	5,070	5,209
Proportion of land in farms	10.1	11.7	15.6	14.9	15.2	15.4
Irrigated land in farms (acres) x 1,000	727	567	542	824	752	777
Cropland harvested (acres) x 1,000	421	252	361	191	161	152
Cropland used for pasture (acres) x 1,000	145	252	361	191	161	152
Other pasture (acres) x 100	6,217	7,338	9,503	9,441		
Number of full-time operators	2,423	2,118	1,613	1,408	1,514	1,509
Full-time as % of all operators	78	74	69	65	72	73
No. cattle and calves x 1,000	162	189	531	609	581	633
No. cows and heifers per farm	101	140	140	181	193	220
No. sheep and lambs: x 1,000	320	370	312	235	208	155
per farm	496	501	516	574	695	583
Crops:						
Wheat acres x 1,000	17	10	20	20	11	28
Barley acres	21,048	15,787	11,875	11,387		
Oats acres	5	4	3	4		
All hay: acres x 1,000	372	319	290	449	430	441
tons x 1,000	565	509	512	805	933	925
Alfalfa hay acres x 1,000	100	116	121	148	160	176
Wild hay acres x 1,000	201	163	110	236	223	196
Value of all products sold (x 100,000)		34	57	51	79	131
Livestock as % of total		75	80	67	85	58

Source: Census of Agriculture.

Table 23. Agricultural Statistics for Nevada, 1950-1974

	1974	1973	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963	1962	1961	1960	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950
Number of farms	2,710	2,627	2,524	2,426	2,321	2,218	2,115	2,012	1,909	1,806	1,703	1,600	1,497	1,394	1,291	1,188	1,085	982	879	776	673	570	467	364	261
Average size of farm	2,521	2,437	2,344	2,251	2,158	2,065	1,972	1,879	1,786	1,693	1,600	1,507	1,414	1,321	1,228	1,135	1,042	949	856	763	670	577	484	391	298
Proportion of land in farms	10.1	11.7	12.8	14.9	16.9	18.9	20.9	22.9	24.9	26.9	28.9	30.9	32.9	34.9	36.9	38.9	40.9	42.9	44.9	46.9	48.9	50.9	52.9	54.9	56.9
Irrigated land in farms (acres) x 1,000	737	687	637	587	537	487	437	387	337	287	237	187	137	87	37	17	17	17	17	17	17	17	17	17	17
Crop land harvested (acres) x 1,000	431	381	331	281	231	181	131	81	31	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Crop land used for pasture (acres) x 1,000	142	132	122	112	102	92	82	72	62	52	42	32	22	12	12	12	12	12	12	12	12	12	12	12	12
Other pasture (acres) x 100	6,517	5,718	4,919	4,120	3,321	2,522	1,723	924	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125
Number of full-time operators	2,423	2,318	2,213	2,108	2,003	1,898	1,793	1,688	1,583	1,478	1,373	1,268	1,163	1,058	953	848	743	638	533	428	323	218	113	7	3
Full-time as % of all operators	76	74	69	62	55	48	41	34	27	20	13	6	1	1	1	1	1	1	1	1	1	1	1	1	1
Hay and alfalfa (acres) x 1,000	162	182	202	222	242	262	282	302	322	342	362	382	402	422	442	462	482	502	522	542	562	582	602	622	642
Wheat and barley (acres) x 1,000	107	140	173	206	239	272	305	338	371	404	437	470	503	536	569	602	635	668	701	734	767	800	833	866	899
Wheat and barley (acres) x 1,000	320	370	420	470	520	570	620	670	720	770	820	870	920	970	1,020	1,070	1,120	1,170	1,220	1,270	1,320	1,370	1,420	1,470	1,520
Wheat and barley (acres) x 1,000	480	601	722	843	964	1,085	1,206	1,327	1,448	1,569	1,690	1,811	1,932	2,053	2,174	2,295	2,416	2,537	2,658	2,779	2,900	3,021	3,142	3,263	3,384
Crops	17	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240
Wheat acres x 1,000	21,048	16,787	12,526	8,265	4,004	1,743	1,482	1,221	960	799	638	477	316	155	15	15	15	15	15	15	15	15	15	15	15
Barley acres	2	4	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Other crops	375	379	390	401	412	423	434	445	456	467	478	489	500	511	522	533	544	555	566	577	588	599	610	621	632
All hay: acres x 1,000	262	268	275	281	287	293	299	305	311	317	323	329	335	341	347	353	359	365	371	377	383	389	395	401	407
Hay x 1,000	100	116	131	146	161	176	191	206	221	236	251	266	281	296	311	326	341	356	371	386	401	416	431	446	461
Alfalfa hay acres x 1,000	201	163	110	58	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wheat hay acres x 1,000	553	553	553	553	553	553	553	553	553	553	553	553	553	553	553	553	553	553	553	553	553	553	553	553	553
Value of all products sold (x 100,000)	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82
Livestock as % of total	76	74	69	62	55	48	41	34	27	20	13	6	1	1	1	1	1	1	1	1	1	1	1	1	1

Source: Census of Agriculture.

the data in Table 30 indicate that this increase was greater in Lincoln County than in any other neighboring county. Thus, Lincoln County permittees were able to produce sufficient hay to offset reductions in the use of BLM lands.

2. Not only did hay production double in Lincoln County between 1969 and 1974, but so did the acres of cropland used for pasture, acres of irrigated land in farms, and the acres of cropland harvested. These large increases occurred at the same time that these variables either decreased or remained static in White Pine County and the state. This suggests that private lands in Lincoln County became more intensively farmed after 1969, which coincided with reductions in the use of BLM lands.
3. While the number of full-time operators and the number of farms declined between 1969 and 1974 in Lincoln County, the percentage increased in White Pine County and statewide. This suggests that Lincoln County operators may have sought off-farm work to affect any reductions in income associated with reduced use of public lands.

CONCLUSIONS

This limited number of study areas (observations) and the data used limited the analysis of the changes studied. As a result, the conclusions that follow must be viewed as general tendencies, and not as statistically significant trends.^{17/} While there were differences in the use of federal

^{17/} The tendencies should not be interpreted as being caused by reductions in the use of federal lands. While they appear to be closely correlated with reductions, many other variables may have caused these results to occur.

the data in Table 30 indicate that this increase was greater in Lincoln County than in any other neighboring county. Thus, Lincoln County farmers were able to produce sufficient hay to offset reductions in the use of BLM lands.

Not only did hay production double in Lincoln County between 1959 and 1974, but so did the acres of cropland used for pasture, acres of irrigated land in farms, and the acres of crop-land harvested. These large increases occurred at the same time that these variables either decreased or remained static in White Pine County and the state. This suggests that private lands in Lincoln County became more intensively farmed after 1969, which coincided with reductions in the use of BLM lands.

While the number of full-time operators and the number of farms declined between 1969 and 1974 in Lincoln County, the percentage increased in White Pine County and statewide. This suggests that Lincoln County operators may have sought off-farm work to offset any reductions in income associated with reduced use of public lands.

CONCLUSIONS

This limited number of study areas (observations) and the data used limited the analysis of the changes studied. As a result, the conclusions that follow must be viewed as general tendencies, and not as statistically significant trends. While there were differences in the use of federal

The tendencies should not be interpreted as being caused by reductions in the use of federal lands. While they appear to be closely correlated with reductions, many other variables may have caused these results to occur.

lands by agency and season of use between the counties studied which may have caused some differences between areas (see Table 30), there were also some adjustments that were common to all areas. These include the following:

1. In every county studied, hay production increased in total, as well as relative to the "control" counties chosen. This increased production, acreage, and tonnage was greater than was the decreased use of federal lands. This increase was greater in some areas (e.g., Lincoln and Utah Counties) than in others, but this study indicates that ranchers in these areas were able to offset reductions in the use of federal lands by growing additional hay and/or pasture.
2. While many differences exist between the areas, reductions in the use of federal lands were generally associated with a retarded growth rate of the cattle industry in the counties affected. Every county showed some growth in the cattle sector, but the rate at which cattle numbers increased tended to be somewhat smaller in the areas where major adjustments in the use of federal lands by livestock had occurred.
3. Data were not available which could be used to trace the tenure of permittees before and after the adjustments occurred, but what data were available suggest that most operators were not forced out of business. Allotment files also tended to show that most permits have not been sold to other owners. If data had been available, however, it may or may not have shown that the "turnover" of permits was greater in areas where reduced

lands by agency and season of use between the counties studied which may have caused some differences between areas (see Table 30). There were also some adjustments that were common to all areas. These include the following:

1. In every county studied, hay production increased in total, as well as relative to the "control" counties chosen. This increased production, strage, and forage was greater than was the decreased use of federal lands. This increase was greater in some areas (e.g., Lincoln and Utah Counties) than in others, but this study indicates that ranchers in these areas were able to offset reductions in the use of federal lands by growing additional hay and/or pasture.
2. While many differences exist between the areas, reduction in the use of federal lands were generally associated with a reduced growth rate of the cattle industry in the counties affected. Every county showed some growth in the cattle sector, but the rate at which cattle numbers increased tended to be somewhat higher in the areas where major adjustments in the use of federal lands by livestock had occurred.
3. Data were not available which could be used to trace the tenure of permittees before and after the adjustments occurred, but most data were available suggest that most operators were not forced out of business. Adjustment files also tended to show that most permittees have not been sold to other owners. If data had been available, however, it may or may not have shown that the "turnover" of permits was greater in areas where reduced

Table 34. Summary of adjustments to changes in grazing use of federal lands in the five study counties.

County/State	Adjustment			Possible Effect of Reduction
	Approx. Percent Change	Agency	Primary Season of Use	
Cassia, Idaho	-33	BLM	Spring/Fall	<ol style="list-style-type: none"> 1. Most possible effects, minor. 2. The size of sheep operations increased.
	+13	FS	Summer	
	-19	Total		
Bear Lake, Idaho	-45	FS	Summer	<ol style="list-style-type: none"> 1. Retarded growth of cattle sector. 2. Increased hay production. 3. Decrease in percent of full-time operators/off-farm employment.
	0	BLM	Spring/Fall/Summer	
	-39	Total		
Rich, Utah	-25	BLM	Spring/Fall/Summer	<ol style="list-style-type: none"> 1. Shift from wild hay to alfalfa hay production. 2. Percentage of full-time operators declined. 3. Large sheep operations hurt.
	-63	FS	Summer	
	-32	Total		
Utah, Utah	-61	FS	Summer	<ol style="list-style-type: none"> 1. Retarded growth of cattle sector. 2. Hay production increased.
	-16	BLM	Spring/Fall	
Lincoln, Nevada	-26	BLM	All seasons	<ol style="list-style-type: none"> 1. Increased hay production. 2. Intensive use of private lands. 3. Percentage of full-time operators declined/off-farm employment.
	0	FS	Summer	
	-26	Total		

use of federal lands has occurred. This tendency for little turnover in permits seemed to be most prevalent in those areas where the permits were relatively small (Rich, Bear Lake, and Utah Counties). These operators may have always been part-time ranchers, who may not be affected greatly by reductions in the use of federal lands.

4. The data available do not clearly show that reductions in federal use tend to force ranchers to seek off-farm employment, but there is some evidence which suggests (Bear Lake, Rich, and Lincoln Counties) that the percentage of full-time operators tended to decline in the areas affected. This was most evident in the three most rural counties, where alternative employment would be expected to be the least available. The impact of reductions in farm employment represents a research topic deserving greater attention.
5. Even though reductions in the areas studied were sometimes in excess of 50 percent, there was no evidence which suggested that ranchers in these areas switched to other types of operations; ranching remained the dominant enterprise in the areas studied. While this decision may not have yielded the greatest income, it was apparently the preferred alternative.
6. While many exceptions are evident in the data obtained from the agencies, there appears to be a correlation^{18/} between the size of reductions and the number of permittees using an allotment or area. This suggests that single use allotments tend to be

^{18/} Further statistical analysis of this data is being conducted, but the results are not available at this time.

use of federal lands has occurred. This tendency for little turnover in permits seemed to be most prevalent in those areas where the permits were relatively small (Rich, Bear Lake, and Utah Counties). These operators may have always been part-time ranchers, who may not be affected greatly by reductions in the use of federal lands.

4. The data available do not clearly show that reductions in federal use tend to force ranchers to seek off-farm employment, but there is some evidence which suggests (Bear Lake, Rich, and Lincoln Counties) that the percentage of full-time operators tended to decline in the areas affected. This was most evident in the three most rural counties, where alternative employment would be expected to be the least available. The impact of reductions in farm employment represents a research topic deserving greater attention.

5. Even though reductions in the areas studied were sometimes in excess of 50 percent, there was no evidence which suggested that ranchers in these areas switched to other types of operations, ranching remained the dominant enterprise in the areas studied. While this decision may not have yielded the greatest income, it was apparently the preferred alternative.

6. While many exceptions are evident in the data obtained from the agencies, there appears to be a correlation¹⁰ between the size of reductions and the number of permittees using an allotment or area. This suggests that single use allotments tend to be

¹⁰ Further statistical analysis of this data is being conducted, but the results are not available at this time.

more conservatively stocked. It also suggests that the "tragedy of the commons" may not be eliminated by the regulatory actions of the agencies. Furthermore, agency personnel which advocate combining several single-use allotments in an effort to improve management from a biological point of view may be faced with a "people problem" that results in decreased, rather than increased productivity.

7. In many common use allotments where major reductions have occurred, there is (was) generally a larger number of small permits. In most cases the number of animal units permitted is less than 50. This number of animals would not yield sufficient revenue to provide a living for the permittee involved. This implies that a large portion of the permittees allowed to graze their animals on federal lands are not full-time operators, which suggests that off-farm employment may be used to subsidize a ranching hobby. Reductions in the use of federal land would probably not force these ranchers out of business, but it could force full-time operators to either take off-farm employment or give up ranching. Records were not available which would allow the testing of any hypothesis concerning the impact of reductions on the size of permittees, but the changes that have occurred suggest that small, part-time operators and large, full-time operators may have been able to adjust to changes in the use of federal lands, while small, full-time operators may have been forced to either seek off-farm employment, leave the ranch, or subsist at a lower level of income. Analysis of these possible

more conservatively stocked. It also suggests that the "tragedy of the commons" may not be eliminated by the regulatory actions of the agencies. Furthermore, agency personnel which advocate combining several single-use allotments in an effort to improve management from a biological point of view may be faced with a "people problem" that results in decreased, rather than increased productivity.

7. In many common use allotments where major reductions have occurred, there is (was) generally a larger number of small permits. In most cases the number of animals units permitted is less than 50. This number of animals would not yield sufficient revenue to provide a living for the permittee involved. This implies that a large portion of the permittees allowed to graze their animals on federal lands are not full-time operators, which suggests that off-farm employment may be used to subsidize a ranching hobby. Reductions in the use of federal lands would probably not force these ranchers out of business, but it could force full-time operators to either take off-farm employment or give up ranching. Records were not available which would allow the testing of any hypothesis concerning the impact of reductions on the size of permittees, but the changes that have occurred suggest that small, part-time operators and large, full-time operators may have been able to adjust to changes in the use of federal lands, while small, full-time operators may have been forced to either seek off-farm employment, leave the ranch, or subsidize at a lower level of income. Analysis of these possible

differential effects is needed, as very little is known of the dependence of various size operations on the use of federal lands.

Perhaps the most revealing aspect made evident by this study was the general absence of data concerning the historical use of federal lands in the areas studied. Most forests have maintained some records of use, while BLM offices rarely have any data. This would generally not be a major problem if personnel responsible for the management of an area were familiar with the historical patterns of use, but this is rarely the case. Most agency personnel are only familiar with the use of an area during their tenure, which is generally less than five years. The automatic, data processing computer-oriented records systems which have recently been implemented by the BLM and Forest Service should help alleviate this problem in the future. While it is admitted that the past may not be a good basis for future actions, historical records are better than nothing. Perhaps this is one of the major reasons why the BLM has come under fire under various environmental groups concerning the use of their lands, while the Forest Service has not received as much criticism.^{19/} The actions taken by personnel in both agencies may not differ, but at least Forest Service personnel can generally document actions taken in the past, and their resultant impact on livestock use.

The results found in this study indicate that changes in the use of federal lands may not affect ranchers to the degree that some have suggested. This indicates that in the long run ranchers may be able to overcome most adjustments in use that may occur. This does not suggest that incomes or the wealth position of ranchers will not decrease, but it does

^{19/} The decision not to maintain actual use data for Forest Service lands after 1972 may also yield criticism of this agency in the future.

NO
The Forest Service maintains actual use data!!

different effects is needed, as very little is known of the dependence of various size operations on the use of federal lands.

Perhaps the most revealing aspect made evident by this study was the general absence of data concerning the historical use of federal lands in the areas studied. Most forests have maintained some records of use, while BLM offices rarely have any data. This would generally not be a major problem if personnel responsible for the management of an area were familiar with the historical patterns of use, but this is rarely the case. Most agency personnel are only familiar with the use of an area during their tenure, which is generally less than five years. The automatic data processing computer-oriented records systems which have recently been implemented by the BLM and Forest Service should help alleviate this problem in the future. While it is admitted that the best way not to be good basis for future actions, historical records are better than nothing. Perhaps this is one of the major reasons why the BLM has come under fire under various environmental groups concerning the use of their lands. While the Forest Service has not received as much criticism, the actions taken by personnel in both agencies may not differ, but at least Forest Service personnel can generally document actions taken in the past, and their resultant impact on livestock use.

The results found in this study indicate that changes in the use of federal lands may not affect ranchers to the degree that some have suggested. This indicates that in the long run ranchers may be able to overcome most adjustments in use that may occur. This does not suggest that income of the wealthier portion of ranchers will not decrease, but it does

17/ The decision not to maintain accurate use data for Forest Service lands after 1972 may also yield criticism of this agency in the future. The Forest Service must maintain accurate data!!

suggest that ranchers may be more resilient to changes in the use of federal lands than has been suspected in the past.

BIBLIOGRAPHY

- Conley, Sam W., E. E. Blanchz and H. W. Snowman. 1964. Effects of Selected Changes in Federal Land Use on a Rural Economy. Oregon Agricultural Experiment Station Bulletin 674.
- Council for Agricultural Science and Technology (CAST). 1974. Livestock Grazing on Federal Lands in the Eleven Western States. Journal of Range Management 27(3): 174-181.
- Conley, S. Bruce. 1978. Public Land Grazing: Being, Doing, Social? A paper presented at the annual meetings of the Society for Range Management, San Antonio, Texas. 20 pp.
- Haroldson, Axel and Russell Youmans. 1972. Grant County, Oregon: Structure of the County Economy. Oregon Extension Service Special Report 50, Corvallis. 8 pp.
- Leedy, Harold F. 1975. Range Land Management. McGraw Hill Book Co., New York.
- Idaho Statistical Reporting Service. Various years. Idaho Agricultural Statistics. A yearly publication compiled by the Idaho Livestock and Livestock Reporting Service. Boise.
- Leeds, Eugene P. and David L. Taylor. 1973. Impact of Public Land Policies on the Livestock Industry and Adjacent Communities. Big Horn County, Wyoming. Wyoming Agricultural Experiment Station Research Journal 116, Laramie. 62 pp.
- Nevada Statistical Reporting Service. Various years. Nevada Agricultural Statistics. A yearly publication compiled by the Nevada Livestock and Livestock Reporting Service, Reno.
- Reffers, Marvin E. and John P. Workman. 1971. The Importance of Renewable Grazing Resources on Federal Lands in the Eleven Western States. Utah Agricultural Experiment Station Circular 155, Logan. 44 pp.
- Shaw, Carl F., and John W. Jackson. 1975. The Impact of Change in Federal Grazing Policies on South Central Wyoming Mountain Valley Cattle Ranches. Wyoming Agricultural Experiment Station Research Journal 58, Laramie. 62 pp.
- Pacific Consultants and University of Idaho. 1970. The Forage Resources. A report to the Public Land Law Review Commission. 2 volumes.

suggest that ranchers may be more resistant to changes in the use of
federal lands than has been suspected in the past.

BIBLIOGRAPHY

- Bromley, Dan W., G. E. Blanch, and H. H. Stoevener. 1964. Effects of Selected Changes in Federal Land Use on a Rural Economy. Oregon Agricultural Experiment Station Bulletin 604.
- Council for Agricultural Science and Technology (CAST). 1974. Livestock Grazing on Federal Lands in the Eleven Western States. Journal of Range Management 27(3): 174-181.
- Godfrey, E. Bruce. 1978. Public Land Grazing: Going, Going, Gone? A paper presented at the annual meetings of the Society for Range Management, San Antonio, Texas. 20 pp.
- Haroldsen, Ancel and Russell Yourmans. 1972. Grant County, Oregon: Structure of the County Economy. Oregon Extension Service Special Report 358, Corvallis. 9 pp.
- Heady, Harold F. 1975. Range land Management. McGraw-Hill Book Co., New York.
- Idaho Statistical Reporting Service. Various years. Idaho Agricultural Statistics. A yearly publication compiled by the Idaho Crop and Livestock Reporting Service. Boise.
- Lewis, Eugene P. and David T. Taylor. 1977. Impact of Public Lands Policies on the Livestock Industry and Adjacent Communities: Big Horn County, Wyoming. Wyoming Agricultural Experiment Station Research Journal 116, Laramie. 62 pp.
- Nevada Statistical Reporting Service. Various years. Nevada Agricultural Statistics. A yearly publication compiled by the Nevada Crop and Livestock Reporting Service, Reno.
- Neilsen, Darwin B. and John P. Workman. 1971. The Importance of Renewable Grazing Resources on Federal Lands in the Eleven Western States. Utah Agricultural Experiment Station Circular 155, Logan. 44 pp.
- Olson, Carl E., and John W. Jackson. 1975. The Impact of Change in Federal Grazing Policies on South Central Wyoming Mountain Valley Cattle Ranches. Wyoming Agricultural Experiment Station Research Journal 96, Laramie. 62 pp.
- Pacific Consultants and University of Idaho. 1970. The Forage Resource. A report to the Public Land Law Review Commission. 4 Volumes.

BIBLIOGRAPHY

- Brumley, Dan W., E. E. Blatch, and H. H. Steinhilber. 1964. Effects of Selected Changes in Federal Land Use on a Rural Economy. Oregon Agricultural Experiment Station Bulletin 604.
- Council for Agricultural Science and Technology (CAST). 1974. Live-stock Grazing on Federal Lands in the Eleven Western States. Journal of Range Management 27(3): 174-181.
- Godfrey, E. Bruce. 1978. Public Land Grazing: Going, Going, Gone? A paper presented at the annual meeting of the Society for Range Management, San Antonio, Texas. 20 pp.
- Karjane, Avel and Russell Townsend. 1975. Grant County, Oregon: Structure of the County Economy. Oregon Extension Service Special Report 358, Corvallis. 9 pp.
- Kelly, Harold F. 1975. Range Land Management. McGraw-Hill Book Co., New York.
- Idaho Statistical Reporting Service. Various years. Idaho Agricultural Statistics. A yearly publication compiled by the Idaho Crop and Livestock Reporting Service. Boise.
- Lewis, Eugene F. and David T. Taylor. 1977. Impact of Public Land Policies on the Livestock Industry and Adjacent Communities. Big Horn County, Wyoming. Wyoming Agricultural Experiment Station Research Journal 10, Laramie. 62 pp.
- Nevada Statistical Reporting Service. Various years. Nevada Agricultural Statistics. A yearly publication compiled by the Nevada Crop and Livestock Reporting Service, Reno.
- Reisen, Garvin B. and John F. Workman. 1971. The Importance of Livestock Grazing Resources on Federal Lands in the Eleven Western States. Idaho Agricultural Experiment Station Circular 151, Logan. 44 pp.
- Gibson, Carl E., and John W. Jackson. 1975. The Impact of Change in Federal Grazing Policies on South Central Wyoming Mountain Valley Cattle Ranches. Wyoming Agricultural Experiment Station Research Journal 35, Laramie. 62 pp.
- Pacific Consultants and University of Idaho. 1970. The Forage Resource: A report to the Public Land Law Review Commission. 4 Volumes.

Perryman, J. Stephen and Carl E. Olson. 1975. Impact of Potential Changes in BLM Grazing Policies on West Central Wyoming Cattle Ranches. Wyoming Agricultural Experiment Station Research Journal 87. Laramie. 17 pp.

Reed, A. D. 1974. The Contribution of Range Land to the Economy of California. California Cooperative Extension Service (MA-82), Davis.

Sharp, Lee A. 1970. Suggested Management Programs for Grazing Crested Wheatgrass. Forest, Wildlife, and Range Experiment Station Bulletin No. 4, University of Idaho, Moscow. 19 pp.

Utah Crop and Livestock Reporting Service. Various years. Utah Agricultural Statistics. A yearly publication compiled by the Crop and Livestock and Reporting Service, Utah Department of Agriculture, and Statistical Reporting Service, U.S.D.A. Salt Lake City.

19
Fryman, G. Stephen and Carl E. Olson. 1975. Impact of Potential
Changes in Grazing Policies on West Central Wyoming Cattle
Ranchers. Wildlife and Agricultural Experiment Station Research Journal
57. Laramie. 17 pp.

Reed, A. B. 1975. The Contribution of Range Land to the Economy of
California. California Cooperative Extension Service (MA-82).
Davis.

Sharp, Lee A. 1970. Suggested Management Program for Grazing Cattle
on Sagebrush, Forest, Wetlands, and Range Experiment Station Bulletin
No. 4. University of Idaho, Moscow. 12 pp.

Utah Cattle and Livestock Reporting Service. Various years. Utah Agricultural
Survey Service. A yearly publication compiled by the Cattle and Live-
stock and Reporting Service, Utah Department of Agriculture, and Stat-
istical Reporting Service, U.S.D.A. Salt Lake City.

Bureau of Land Management
Library
Bldg. 50, Denver Federal Center
Denver, CO 80225